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CONVENTIONAL ATTRITION AND BATTLE TERMINATION CRITERIA

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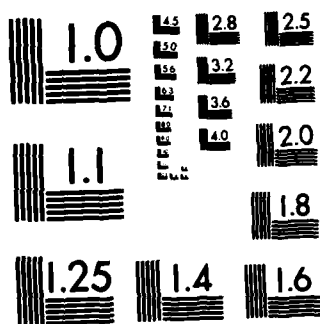
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**CONVENTIONAL ATTRITION AND BATTLE
TERMINATION CRITERIA**
A Study of War Termination

Historical Evaluation and Research Org.

P.O. Box 157

Dunn Loring, Virginia 22027

1 August 1982

Technical Report

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This study (1) distinguishes among, and briefly describes the terminations of, battles, campaigns, and wars; (2) discusses concepts and terminology for war termination; (3) presents three case studies of terminations of short, post-1945 wars; (4) presents a survey of the literature on war termination; and (5) presents in matrix form data on 13 20th Century war terminations. The study does not find any significant association between casualty levels and war termination.		

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BATTLES, CAMPAIGNS, AND WARS: WHEN DO THEY END?
A HISTORICAL ANALYSIS

In trying to understand why wars have ended when they have, and to predict when present and future wars will end, it is tempting to examine the endings of battles and campaigns, and try to draw parallels with, or extrapolate to, the endings of wars.*

In the present essay an attempt will be made to clarify the circumstances under which battles and campaigns end, so that the similarities and lack of similarities with war endings will be more clearly exposed.

Campaign Endings

Basically, a campaign may be defined as a collection of battles grouped together for bookkeeping purposes. It is

* One attempt to do this is that of Frank L. Klingberg, "Predicting the Termination of War: Battle Casualties and Population Losses," Journal of Conflict Resolution 10:129-71. For relatively short and limited wars, Klingberg found no significant relationship between casualties suffered before breaking off a battle and population losses suffered before ending a war. For all-out wars fought for major or unlimited objectives, he did find something more closely approaching consistency; ratios of percent of battle casualties (with respect to armed force strength) to percent of population loss for the losing side in three such wars (note small number of cases, the only ones for which data was available) varied from 4.0 (Confederate States) to 5.8 (Germany in World War I).

useful to subdivide wars into these smaller units, which are more comprehensive than individual battles but easier to analyze than entire wars. Since practical need is the chief reason for the concept of the "campaign," what constitutes a campaign is somewhat arbitrarily determined.

In general, three indicators are used to define campaigns: chronology, geography, and objectives.

When chronology is the criterion, the campaign is usually designated by its year; examples are the American Civil War campaigns of 1861, 1862, and so forth. The real boundaries of such a campaign are most often established by weather; when weather in which combat is feasible ends, the campaign ends.

Clearly, if a campaign's boundaries are chronological, there is little that can be learned about the termination of wars from examining the termination of such a campaign. Few wars have been permanently ended by the onset of winter or bad weather.

Geography, as a basis for designating a campaign, is, like chronology, basically a convenience. Examples of campaigns so designated are the Red River Campaign (1864) and the Normandy Campaign (1944). Again, the endings of these campaigns are not comparable to the endings of wars.

Finally, there are the campaigns that are designated by their objectives. The Ulm campaign (1805) is so called because it ended with the capitulation of Ulm; Napoleon had accomplished his objective. The Austerlitz campaign of the same year ended with Napoleon's victory at Austerlitz and the complete collapse of the hostile alliance and capitulation of Austria. These two campaigns are sometimes joined by historians and called "the Campaign of 1805," but it is much more useful to consider them as separate campaigns, each bounded and defined by its objectives, with one directly and logically following the other.

A campaign that is designated by its objective, and is bounded by the achievement of that objective, is comparable to a battle in that respect. This is not true of campaigns that are bounded and designated by the much more arbitrary measures of chronology or geography. However, it must be stressed that bounding and designating a campaign is largely a matter of bookkeeping convenience, and that two campaigns do not necessarily differ in their inherent natures because one is designated by objective and another by geographical area.

It should be noted that in the first two kinds of campaigns casualty levels or rates play no significant defining or terminating role. High casualties might be a factor in the termination of a campaign that was focused on and designated by an objective, and which ended with abandonment of the quest for that objective.

Battle Endings

In order to understand battle endings it is useful to look first at battle outcomes.

The outcome of a battle -- that is, the answer to the question, "Who won the battle?" -- may be determined by three indicators:*

- mission accomplishment
- ground gained
- casualties incurred (expressed in three ratios: as a percentage of the casualties of the other side; as a percentage of the strength of the other side at the beginning of the battle; and as a percentage of one's own strength at the beginning of the battle.

The answer to the battle termination question, "When do battles end?," is related to the first indicator of battle outcome -- mission accomplishment. The battle ends when the mission of one side has been accomplished. If the defender stops defending and withdraws, the attacker has taken his objective

* These are the indicators of battle outcome HERO has used in previous military studies. They are simply a concise and explicit formulation of common military judgment.

and accomplished his mission. If the attacker relinquishes the attempt to take his objective and stops attacking, the defender has accomplished his mission. In either case, the battle is over.

The point that battles are mission oriented must be stressed. It is true that casualties play an important role in a commander's decision to break off an attack or to withdraw. However, if the mission is judged very important or essential, very high casualties will be accepted. The range of casualties that will be accepted before a battle is broken off is very wide and varies with the importance attached to the mission. Nevertheless, it is also important to note that battles almost never last until one side is unable to continue fighting. Unless the battle is a last stand at the end of a war, the commander whose side is failing to accomplish its mission will conserve his force for future battles. It is not reasonable to continue fighting once it becomes clear that the objective cannot be attained, with the forces at hand.

War Endings

To say briefly here when wars end is to beg a question to which a fairly voluminous literature (see "Survey of Literature on War Termination") and a considerable effort in this study have been devoted. Nevertheless, on one level it is both safe and useful to say that wars end either because one side is physically unable to continue fighting or because one side is no longer willing to make the effort required to continue.* It is true that there is hardly a historical case in which one side was literally physically unable to continue fighting. It is also true that a war ending because one side is no longer willing to continue fighting may sound like a tautology. However, one early war termination analyst, H.A. Calahan, judged, and HERO also judges, that there is a real difference between war terminations that occur because one side is virtually unable to

* A nearly war termination analysis, Calahan 1944, comes to this conclusion, and it is one that is almost certain to appeal intuitively to military historians with knowledge of a large number of wars.

fight longer and those that occur because at least one side decides that the goals it can reasonably expect to gain by further expenditure of people, materials, and effort are not worth that additional expenditure.

The following wars may serve as examples of wars that have ended when one side was unable to continue fighting;

- Third Punic War (149-146 B.C.; Carthage defeated and destroyed by Rome)
- Lopez War (1864-1860; Paraguay defeated by Argentina, Uruguay, and Brazil)
- Franco-Prussian War (1870-1871)
- US Civil War
- World War II (with respect to both Germany and Japan)

In the following wars, drawn from many in the past thousand years, the side that quit the war could have continued to fight, with a reasonable expectation of obtaining a more favorable result than the one it accepted, but decided that the additional expenditure was not worth the probable gain:

- First Roman-Parthian War (55-38 B.C.)
- American Revolutionary War
- World War I
- Vietnam War (1965-1972)

Some further discussion of these examples may be useful. To look first at the wars that ended when one side was literally or virtually unable to continue fighting, the Lopez War stands out in all modern history as a war in which the defeated country lost almost all its able-bodied men; Paraguay's total population was reduced by almost 85%. In the Franco-Prussian War, France was decisively defeated early in the war, refused to recognize that the war was lost, raised a new army, and finally accepted defeat only after the long siege of Paris and its fall. The terminations of the other wars will be familiar to the reader.

It should be pointed out that the phrase "unable to continue fighting" usually means that the state's collective military force has been destroyed as a military force. This need not mean, and hardly ever does mean, that most of its fighters have been killed and most of its weapons destroyed. The case of

Paraguay in the Lopez War is exceptional. What it means is that the state's forces have been rendered ineffectual by casualties, dispersion, capture, isolation from their sources of supply, or a combination of all these. It is this destruction of the enemy force as a military force that is the primary military aim of both sides in a war. Infliction of casualties is secondary, and is viewed as a means to achieve that aim. This point may seem obvious and simplistic, but it is often forgotten or overlooked by analysts.

The examples in the second group, those in which the defeated power could have continued fighting but did not, may now be examined. The Romans suffered a severe defeat and very heavy losses at the hands of the Parthians; the Roman commander was killed. Nevertheless, the Romans had the capability to renew their attack and probably to wrest control of Mesopotamia from the Parthians. They chose not to expend resources in this way. This also was basically the case with the British in the American Revolution and the United States in the Vietnam War. The Germans sought an armistice to end World War I when they still retained much of the territory they had conquered in the first year of the war, when Germany itself had not been attacked, and when the German armies were capable of continuing the fight. Although Germany could not have gained, through further fighting, the ability to dictate peace terms, it could probably have gained considerably more favorable terms than those it accepted. However, neither the German public nor the German Army had the will to continue fighting, and the collapse of the German government precipitated the effort to seek peace.

Comparison of Battle, Campaign and War Endings

In discussing battles, great stress has been laid on the role of the mission in determining why the battle ends when it does. Each side has a mission in each battle, and when one side has achieved its mission the battle is over. This is also true of those campaigns that are more than purely arbitrary groupings of battles.

It is much less true of wars. It is true -- and fundamental -- that each side in a war is fighting for a political stake, or a collection of "war aims." However, these tend to change during war, and to be very much functions of what gains are possible and what cost is required. This is especially true of prolonged wars, those lasting more than a year. The case studies carried out for this report have shown that in short wars for limited goals the winning side's achievement of its war aims can be a key factor in war termination. The China-India War (1962), French-Tunisian conflict (1961), Falklands War (1982), Arab-Israeli Six-Day War (1967), and the Austro-Prussian War (1866) are examples.

The ending of a war involves agreement -- not necessarily an explicit or formal agreement -- between the two sides, as well as among allies on each side, if several states are involved. Conditions must be set and accepted for ending the combat. The ending of a war involves the giving and receiving of assurances by both sides that the fighting will not be renewed. Although the aim in this study is to focus on the military, rather than the diplomatic, aspects of war termination, the matter of terms and agreement cannot be ignored, because it is precisely in this that war endings differ especially sharply from battle endings. A battle ends automatically when one side accomplishes its mission. Agreement is required to end a war.

Some examples may emphasize this point. Although it has been said that it is the loser who determines when a war ends (Calahan 1944), we have seen above that this does not apply to the India-China War of 1962. Also, there have been occasions when a loser tried and failed to end the war. In early 1918 the leaders of the new Bolshevik government of Russia refused to accept German peace terms but declared that the war was over and that they would not fight any longer. Germany simply renewed its assaults. The Russians were forced to accept a still more disadvantageous peace agreement. And Japan tried to negotiate peace with the Allies early in 1945, by diplomatic initiatives through Russia; the USSR simply refused to pass on the negotiation request.

Summary of War, Campaign, and Battle Endings

Thus, battles end when one side has accomplished its mission. Campaigns can end when one side has achieved the major objective which is the focus of the campaign. Wars end either when one side can no longer fight -- usually because its military force has been destroyed as a force -- or when one side chooses not to make the expenditure in people, material goods, and time that would be necessary to continue the war. War endings require the formal agreement of both side, and involve a contract of terms offered and accepted. These terms then form part of the outcome of the war. No such agreement is involved in the ending of battles and campaigns; these automatically end when one side accomplishes its mission, and the outcome is inherent in the events of the battle -- casualties suffered and inflicted, ground changing hands, missions accomplished or not accomplished.

There is thus no logical basis for treating a battle as a microcosm of a war, and a battle ending as a microcosm of a war ending, and extrapolating from one to the other.

WAR TERMINATION: CONCEPTS AND TERMINOLOGY

In order to deal usefully with the subject of war termination, it is necessary first to limit and define the concept. In order to do that, something must first be said about how wars are fought. There are many approaches to this immense subject. The following brief discussion is based on a military, historical, and descriptive approach; that is, it is based on military judgment informed by a broad and fairly detailed knowledge of past wars. Where assumptions are made, they are identified.

The first assumption is that wars are fought for political goals, such as acquisition of territory, national independence, or defense of national territory. Although some investigators have believed that war breaks out as a result of accumulations of weapons and of tension caused by these weapons,* and although it is here acknowledged that these factors may be significant, it is the judgment of the HERO investigators that the political goals for which war is fought are real and are often more important in determining the onset of war.

Political goals are sought in war by achieving the military objective of destroying or neutralizing the effectiveness of the enemy's military forces. This objective is achieved by deploying and maneuvering armed forces in such a way that the enemy's armed forces are killed, incapacitated, or cut off from sources of supply and reinforcement. The objective is to destroy the enemy's

* See, for example, the discussions of the work of Lewis Richardson in the entries for Carroll, "War Termination and Conflict Theory: Value Premises, Theories, and Policies", and Rapoport. (All short references to works on war termination are to items listed and annotated in the "Survey and Analysis of the Literature" that forms part of this report.)

forces as effective fighting forces, not to inflict casualties per se. War is not a continuum of conflict measured in the steady accretion of casualties and destruction and terminated when casualties reach a certain level. There are many examples of wars in which the conflict continued despite apparently overwhelming casualties. (For example, Germany's invasion of the USSR, 1941-42.) There have been a number of wars in which the strategic advantage in the war shifted back and forth several times before one side finally prevailed (for example, Poland vs. the USSR, 1920).

Thus, Figure 1 does not meaningfully represent what happens in the course of a war:

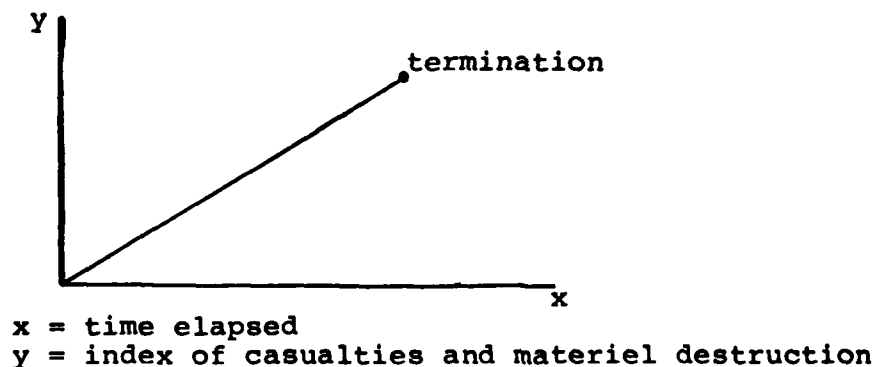


Figure 1

If war termination were only a given point on a casualties-manpower curve, it would not be worth separate consideration. It is only if it is a separate phase of the war, with characteristics, processes, and methods of its own, that it is worth such consideration. In this report, termination will be treated as such a phase, a phase that begins when the outcome of the war is reasonably clear -- i.e., when it would be clear to an objective informed observer which side was going to succeed and which side was going to fail to achieve its war goals -- and ends when both sides cease hostilities.

In practice, of course, it is extremely difficult, and sometimes impossible, to draw the line between the major part of the war, in which a decision is reached, and the termination phase. By drawing this line conceptually, however, a clearer picture of the termination phase can be gained. Following Kecskemeti 1970 and Kettelle 1981, this dividing line can be placed -- as indicated just above -- at the point at which an informed, objective outside observer could predict the outcome of the war. Kecskemeti cites Clausewitz's "principle of irreversibility" (which Clausewitz used only in a tactical context, apparently): From the moment that a commander's reserves become inferior to those of his adversary, the decision must be considered to have been reached. This point of irreversibility seems to be identical with Kettelle's "PREDICT" point, the point at which the outcome is objectively predictable.

One can say, then, that the termination phase of the war begins when the outcome of the war has been decided. Drawing this line and establishing the concept of a termination phase makes it possible to deal with war termination as something distinct from waging war. There are, however, certain problems related to the matter of the "irreversibility" point or PREDICT point which must be noted. There are cases in which an informed, objective observer would have said that the outcome of a war was decided, and yet new factors appeared and changed the outcome. A striking example is the way in which the death of the Empress Elizabeth of Russia reversed the outcome of the Seven Years' War (1756-1763). New allies, new weapons, a weakening of the enemy's internal support for the war -- any of these may serve as unforeseen reserves and make the PREDICT point that seemed clear become an illusion. Nevertheless, in this investigation, the concept of a point at which the outcome becomes clear, and which marks the beginning of the war's termination phase, has proved useful, and it will be used in this report; it will be referred to as the Predict point.

The question of when the termination phase ends must now be considered. First, it should be established that since this investigation is carried out for a military command and deals with military methods of bringing wars to an end, the matter of peace treaties will not be considered. The war will be considered to have terminated when hostilities have ended, with the understanding by both sides, explicit or tacit, that they will not begin again at a foreseeable time. In other words, a ceasefire or armistice that applies to all the forces engaged in a conflict and that is observed for a reasonable length of time (a year may serve as a suitable arbitrary limit) will be considered to mark the end of the hostilities.

Specifically, the point at which the losing side sues for peace will be considered the end of the termination phase. As Calahan 1944, Kettelle, and others have noted, it is usually the losing side that finally determines when the war ends. The point at which the losing side agrees to stop fighting will be called the Quit point in this report, and will be considered to mark the end of the termination phase and the end of the war.*

Ideally, it would be desirable to identify the point at which the losing side decides to stop fighting. Until that point, military action can presumably have considerable, and probably the major, impact on the process of termination; after that point, negotiation would seem to be more important. However, in carrying out the case studies for this investigation it was found that for recent wars, in which gaining knowledge of the internal decision-making process of the losing regime is in most cases not

* The term Quit point is adapted from Kettelle's usage. It must be noted that Kettelle distinguishes at least four separate points in the termination process between the Predict point and the end of the war, and does not use the term Quit point in precisely the way it is used in the current report.

possible, the only practical course is to consider the Quit point to be the point at which the losing side agrees to stop fighting.

There is, of course, an extensive overlapping of diplomatic and military action during the termination phase of a war, and although the focus in this report is on military action, the diplomatic process cannot be ignored. The following figure may clarify the concept of the termination phase.

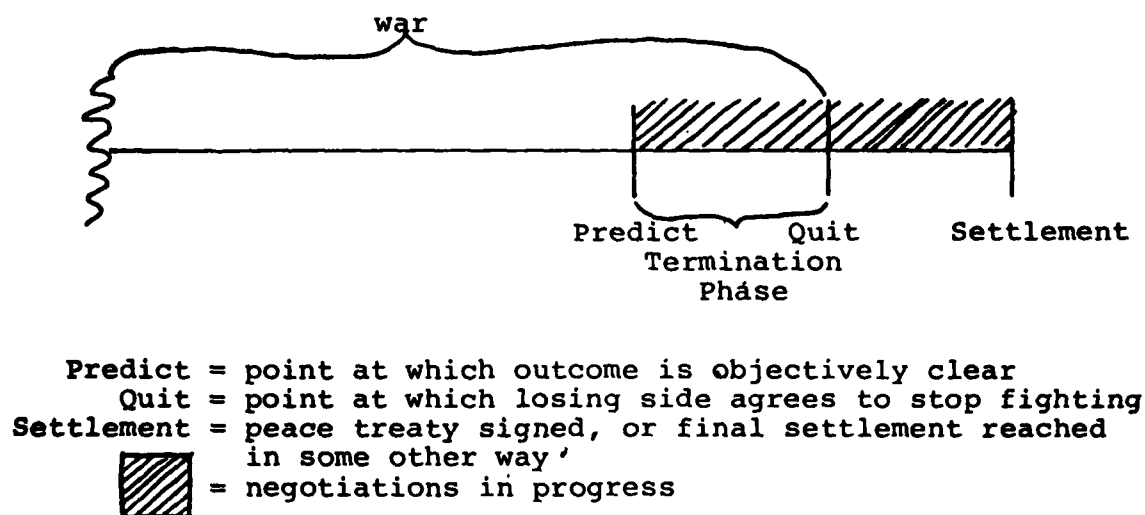


Figure 2

Now that the termination phase has been theoretically bounded, the question arises as to what useful things can be learned about it. One approach is to try to find ways in which it can be shortened, on the assumption that the losses endured by both sides during this period are unnecessary, since the outcome is decided; Kettelle takes this approach. Certainly great loss of life and destruction has occurred during the very long termination phases of some wars. In the Franco-Prussian War of 1870-1871, the Predict point was reached after two months of war: The French forces had been destroyed, half of them captured and the rest cut off and under siege in Metz; two German armies were advancing on Paris.

The French, however, refused to acknowledge defeat, raised new armies, and only surrendered after the siege and capture of Paris, another four months later. In effect, the major part of the war was fought after the outcome was clear to any objective observer.

In this discussion of concepts and terminology on war termination, it remains to deal with the matter of the winning and losing sides. Careful consideration has been given to the question of terminology for these concepts. Many writers believe these terms should be avoided and stress that neither side may actually win a war, or that the side that wins the war may be a "loser" in the long run.* It is true that the matter of winning and losing in war is complex, but it has been found in the course of this investigation that if the winner is defined as the side that has come closest to achieving its initial war goals when hostilities end, and the loser is defined as the side that has failed to achieve its initial war goals when hostilities end, it is fairly easy to identify winners and losers. These terms seem to fit specific wars better and to be more useful than other terms that were considered, including "sustainer" and "quitter", and "Side A" and "Side B". Looking at the two sides in a war in terms of goal achievement and winning and losing also revealed the importance the winner's goal achievement can have in war termination. (See "Three Case Studies on War Termination".)

* See the papers in Fox 1970.

THREE CASE STUDIES ON WAR TERMINATION

ANALYSIS

Attached to this paper are brief accounts of three post-1945 conflicts. These accounts are organized so as to display the basic data on the conflicts, together with summaries of the events of each conflict and some comment on them, and specifically on their terminations. Following is a brief description of how the cases were selected and examined, and some comments on what they seem to show about war termination.

Selection of Cases

A fairly extensive and detailed examination of the literature on war termination showed that none of the published research on ways in which war termination could be predicted on the basis of quantified indicators appeared very promising, and correspondence with several leading investigators who had published work in this field indicated that none of them had work in progress on war termination.* On the basis of HERO's assessment of the literature, it was decided that an examination of specific cases of war termination would be a useful contribution to greater understanding of the subject. The aim was strictly heuristic; that is, there was no expectation that the study of several individual cases would contribute significantly to the ability to predict war termination in future conflicts, and certainly no

* Investigator's correspondence with Cynthia A. Cannizzo, M.O. Edwards, Berenice A. Carroll, and J. David Singer.

expectation that it would contribute significantly to the ability to manipulate events so as to bring about war termination. However, since a reasonable understanding of a given process is necessary in order to manipulate it, it was believed that the case study method would be useful at this stage of investigation. Several of the workers in this field have also urged more specific case studies.*

Because the present study was oriented toward possible future conflict scenarios, and because the client had expressed an interest in studies of recent conflicts, it was decided to select post-1945 cases. A list of 10 studies was drawn up, selected for the variety of environments in which they took place, and also for their relative brevity, in most cases, since protracted wars did not appear relevant for the present study. It was intended that all 10 cases would be studied, but time limitations and reallocation of resources for the study meant that only three were carried out: the French-Tunisian conflict of 1961; the China-India War of 1962; and the India-Pakistan War of 1965. These were simply the first three that had been done, and it is important to point out that these three studies were not selected because of any characteristics of their terminations, but basically at random (although no systematic random selection process was carried out). The investigator knew nothing in any detail about the terminations of these conflicts when the case studies were begun, and in some cases had preconceptions that turned out to be mistaken (for example, that China's 1962 invasion of India was unprovoked and that China gained territory by it). In summary, these cases were selected because they were brief, post-1945 conflicts, and not because of any characteristics their endings shared. Thus it may be of value to examine the characteristics these randomly selected terminations did have in common,

* For example, Carroll, "How Wars End" (cited in this report's "Survey of the Literature"), p. 316.

and to see how well they fit the various theories on war termination.

When Did These Wars End?

These wars appear to have been extremely goal-oriented, and their terminations strongly goal-connected. Of course, all wars are fought for goals, but these may be nebulous and often change during the course of the war. In these wars, the goal was clear for each side, and especially clear for the winner. Also, the war terminated in each case shortly after the winner had secured its goal. Perhaps this is not surprising, since the wars under consideration lasted from only four days to a month, and thus were comparable in length to battles and campaigns rather than to most wars. Each ended when one side had achieved its goal (accomplished its mission) and when the other side was unable or unwilling to continue fighting. Both conditions appeared necessary for termination.

At this point it may be useful to review briefly the termination of each of the wars.

The French-Tunisian conflict of 1961 lasted just four days, and the entire conflict, from the point France decided to reinforce its beleaguered base at Bizerta, may be regarded as the termination phase. France quickly brought superior weaponry, training, and tactics to bear, achieved its objective of relieving the base and eliminating any further threat to it, and unilaterally declared a ceasefire. Tunisia then also accepted a ceasefire. The fact that the United Nations had called for a ceasefire eased Tunisia's acceptance of the fait accompli.

In the China-India war of 1962, China had goals that appear clear in retrospect, and achieved them. China wished to remove Indian military encroachments into disputed border areas, to secure these borders permanently, and to demonstrate its military power to enforce its claims in these areas. It did not wish to conquer Indian territory or even to gain military control over all the border areas it claimed. In an effectively planned campaign with good logistical support it cleared Indian forces from

the disputed areas in the first eight days of fighting, and offered the peace terms that were eventually accepted. This may be regarded as the Predict point, following the terminology adopted for this report; that is, it was the point at which an objective, informed observer could have predicted the outcome. India did not accept the terms, and the termination phase of the war consisted of a Chinese offensive that cut off and destroyed organized resistance in the area and brought the Chinese forces to the edge of the rugged mountains in which the fighting had taken place, apparently poising them for an easy invasion of the Assam plain. At this point, China unilaterally declared a ceasefire and withdrew to its original positions, stating that both sides would refrain from stationing military forces within 20 kilometers of the border. India tacitly accepted the terms.

The India-Pakistan war of 1965 is often described as having ended in a stalemate, and it is true that both sides suffered heavy and approximately equal casualties and neither side advanced far into the territory of the other. However, if the war is looked at from the point of view of goal achievement and ability to continue fighting, it seems clear that India was the winner, since it achieved its goal of keeping Kashmir within India, while Pakistan failed to achieve its goal of incorporating Kashmir and, apparently, would have had great difficulty in continuing fighting because of weapons attrition. This three-week war had a one-week termination phase; India accepted a ceasefire on 19 September, and Pakistan accepted on 22 September. There was no striking change in the military situation during the week, and presumably Pakistan decided during this period to accept the ceasefire because of its assessment of its resources; it had had large numbers of tanks destroyed and damaged, and a US embargo on shipments to both combatants worked against Pakistan primarily, making it impossible to replace and repair its US Patton tanks.

Application of Theories of Termination

It now may be useful to compare the endings of these three wars with some of the theories that have been offered on war termination. Each paragraph below deals with a separate theory or general statement about war termination that has been set forth by one or more analysts in this field. All references to authors by name are to works listed and annotated in the "Survey of the Literature" that forms part of this report.

Calahan stresses that, while the winner largely determines the peace terms, it is the loser who determines the end of a war. It is true that in all three of these wars it was the loser that was last to agree to an ending of hostilities, so that none of the wars actually ended until the loser gave the word. However, to say no more than this distorts the termination picture and gives too little attention to the importance of the winner achieving its goals. It is highly unlikely that any of these wars would have ended so promptly if one side had not successfully achieved its objective and therefore been eager to stop fighting.

Both Calahan and Ikle note that a sudden, strong blow is more likely to bring about termination than is gradual attrition, although the latter tells in the long run. The lightning campaigns of the Chinese (1962) and French (1961) may be seen as such swift blows. There were, however, no such sudden blows in the India-Pakistan war of 1965; the decisive Pakistani defeat in the Khem Karan battle must have had considerable psychological impact on the Pakistani leadership, but it did not precipitate termination. Weapons attrition seems to have been the decisive factor in persuading Pakistan to terminate.

The loss of "markers" -- that is, capital cities or other objects of symbolic value -- which Coser speaks about (Carroll, "How Wars End") does not seem to have been significant in the India-Pakistan war. However, in the French-Tunisian conflict,

the French capture of the town of Bizerta and shelling of its casbah probably gave a strong psychological impetus for surrender. (Saying this does not imply that the French took the action for this reason; the Tunisian troops were in the town, and capturing it was a military necessity for the French.) In the China-India war, three dramatic "markers" are evident -- the cutting off of the brigade-size Indian force holding the supposedly impregnable pass of Se La; the Indian evacuation of the government center and corps headquarters of Tezpur; and the arrival of the Chinese troops at the geographical line between the Himalayan border area and the Assam plain.

Cannizzo places wars on a spectrum between short "routs" and long "wars of attrition." Two of the wars under consideration were routs, but the third, although short, cannot be considered a rout. Cannizzo also finds that when two sides are about equal in strength, the war is likely to be long; that the greater the initial numerical superiority, the shorter the war; and that the shorter the war, the greater the probability of the stronger side winning. All these points are consistent with what happened in these wars and are strikingly illustrated by the French-Tunisian war. With regard to the last point, it is not difficult to imagine that if the conflict had been less vigorously prosecuted and had lasted longer, aid for Tunisia might have poured in, and France might have been under increasing pressure to withdraw. (In the end, France did, in fact, withdraw, but it was able to do so with some national dignity and not under fire.)

Porsholt (Carroll, "How Wars End") says that wars end when the costs outweigh the probable gains from continuing for both sides, and expresses this statement mathematically. This is true for the wars in question, and in fact appears true for all wars (tautologically true, as Kecskemeti has pointed out), but the emphasis on costs and on possible future gains overlooks an important possibility: One side may have clearcut limited goals, may achieve them, and may wish to terminate the war for that

reason. That was clearly the case in two of the wars under consideration here, and apparently also true in the third (India-Pakistan).

Carroll ("War Termination and Conflict Theory") divides analysts of war and war termination into those who see war as "fightlike" and those who see it as "gamelike." Certainly the wars in this group of case studies do not fit the paradigms of the "fightlike" theorists, such as Lewis Richardson. Richardson saw war as like a fever which spreads and grows in intensity and then abates as "war weariness" sets in. (See entry for Rapaport.) These wars, far from being determined by this kind of irrational force, were quite firmly under human control. It is true that there was much war enthusiasm in India in 1962 and in Tunisia in 1961. However, in neither case did the decline of war enthusiasm bring about termination; rather the termination of the war seems to have come before the support for it waned.

However, these wars do not seem "gamelike" either, in the sense of being based on rational calculations of gains vs. losses or on threats to the adversary to continue fighting, as the "gamelike" theorists suggest. In each of the three cases, the more successful side, after achieving its goal, declared a cease-fire, or accepted one at the urging of a third party, and waited for the less successful side to agree. A simile that seems to fit this approach to war better than "fightlike" or "gamelike" is "worklike." The more successful side seems to have treated the war as a job to be carried out as quickly and effectively as possible, and to be ended when the task was accomplished.

Kecskemeti stresses what he calls the "irreversibility principle": the outcome of a war is certain when it becomes clear that the reserves of one side exceed the reserves of the other. This idea fits well with Kettelle's "Predict point," the point at which it would be clear to an objective observer that a given side will prevail in a conflict. In practice it is extremely hard to be sure, even in retrospect, at what point a given side first has fewer reserves than its opponent, primarily because

reserves come in such a variety of forms -- weapons, men, military leadership, allies, support of domestic opinion, direction of the war by civil authority, among many others. It was not easy to establish a Predict point in these three case studies. However, carrying out the case studies convinced the investigator that the concept of a termination phase, stretching from the Predict point to the Quit point (point at which the loser, or quitter, agrees to stop fighting) is a useful concept, and that the analytic work required to identify the Predict point is useful work.

The question remains, what induces a losing side to accept the end of hostilities? In the French-Tunisian war, it had become impossible for Tunisia to gain control of the Bizerta base by military means. In the China-India war, it had become clear to India that it did not have the military organization, men, or weapons to resist China effectively and at that same time it was offered dramatically favorable peace terms. In the India-Pakistan war of 1965, it had become clear to Pakistan that it did not have the weapons to continue the war effectively. None of these losers had been destroyed or seriously damaged as a nation. All could have continued fighting and almost certainly would have if the winning power had continued to press the attack. But none could see reasonable hope of gaining the goals for which they had entered the war, and all were faced with an opponent who wished to stop fighting. It is interesting that virtually everything that has been said about these three short wars could also be said about the Falklands war of 1982.

Conclusions

The following statements appear to be true of these three short post-1945 wars:

- Goal achievement by one side was probably the most important factor in determining when the war ended.

- Clear-cut war goals probably contributed significantly to speedy and successful war termination in at least two of the cases.
- Military inability to continue the conflict, resulting from enemy military action, was probably the chief factor responsible for the losing side's decision to stop fighting.
- Favorable terms for terminating hostilities, together with dignified means of effecting the termination, were important factors in the losing side's decision to stop fighting.
- Finally, it must be stressed that these were all short wars for limited goals. In wars for more valued stakes, such as national independence, or survival, the losing side can fight on long after the winning side appears to have achieved its goal and the losing side has no realistic hope of achieving its own goal. The Franco-Prussian War of 1970-71 is a striking example.

FRENCH-TUNISIAN CONFLICT, 1961

Dates

19-22 July 1961

Summary of Conflict

In 1961, Bizerta was one of four main bases of the French fleet, along with Brest, Toulon, and Mers-el-Kebir, Algeria. When Tunisia achieved independence in 1956, France had retained the base, whose harbor is a 10-mile-diameter lake joined to the small bay and commercial Mediterranean Sea port of Bizerta by a 1-1/2-mile-long canal. The Bizerta base had, in 1961, an air-field, naval air base, naval arsenal, dockyards, oil storage facilities, radar station, and military camp. These facilities

were scattered at various points around the northern and southwestern shores of the lake. The core of the base consisted of the airfield and naval air base north of the lake; 5,000 of the 7,400 men of the garrison were stationed there. (See Map 1.)

Beginning in February 1958, Tunisia had intermittently demanded that France evacuate the base. Following negotiations, France had removed all French troops from barracks in the town of Bizerta, and withdrawn them to the base. President Bourguiba of Tunisia had not pressed President De Gaulle of France during the period when the latter was dealing with an uprising of French settlers in Algeria (January 1960 to April 1961).

The 1961 crisis was precipitated when, at the end of June, work began on extending the runway of the base airfield to enable the Mystere fighter (replacing the Mistral) to use the facility. This apparent evidence of French determination to remain permanently in Bizerta led to demands by the ruling political party (Neo-Destour) for evacuation of the base, to mass demonstrations organized by Neo-Destour, and to an announcement by President Bourguiba, on 17 July, that the Bizerta base would be blockaded, beginning 19 July, and that Tunisian forces would be sent into a slice of territory in the Algerian Sahara which Tunisia claimed. (See Map 2.)

Hostilities began on 19 July. Soon after midnight, 10,000 Tunisian civilian volunteers began building barricades on all roads connecting the various installations of the Bizerta base. The Tunisians stopped French trucks and took 35 troops prisoner. The French then confined their troops to camp and surrounded the main part of the base (airfield and naval air base) with barbed wire, setting up a machine-gun post at the entrance.

The French cabinet met during the morning, and at 12:45 PM it was announced that parachute troops were being sent to reinforce the Bizerta garrison. By 6:30 PM French transports from Algeria were dropping an 800-man regiment, and Tunisian antiaircraft

guns were firing at them. French aircraft then machine-gunned the Tunisian antiaircraft positions. At 8:00 PM Tunisia announced the presence of three French cruisers off Bizerta.

On the following day, 20 July, there were mass demonstrations, which were fired on by the French. French forces cleared the barricades, using air bombing and machine-gunning, with aircraft that included some from a carrier off the coast. A second 800-man regiment was flown in during the afternoon. The French encircled the town of Bizerta, cutting it off from the rest of Tunisia; during the evening they opened an offensive against the town, aimed at occupying the Tunisian Army barracks.

The French bombed military targets in Bizerta during the morning of 21 July. A third regiment of parachute troops was flown in from Algeria. At 2:00 PM it took part, with parachute troops already on the scene, in an air drop west of Bizerta, and a subsequent tank-supported attack on the city. They advanced through the modern part of the city to the casbah (Arab quarter), while marine parachutists landed from the sea (presumably from the carrier), turning the Tunisian flank. By 6:00 PM the three French cruisers had forced an entry into the channel (which had been blocked with chains), and by 8:35 PM the barracks had fallen. At 11:30 PM the French command announced that Bizerta had fallen, and that the French were in control of all the Bizerta base installations. They urged that the fighting be ended as soon as possible.

However, fighting continued all the next day, as the Tunisians defended the approaches to the casbah, and pushed the French back "the length of a street" in the morning. The French bombarded the casbah with mortar bombs, not attempting to enter it. Many civilians were reported killed and wounded. At 8:00 PM the French government announced that negotiations for a ceasefire would be opened, and at 9:30 PM Tunisian troops were ordered to cease offensive operations. Sporadic firing continued until 5:00 AM the next morning.

Meanwhile, a volunteer Tunisian force had crossed the Algerian frontier on 19 July in the area of the Sahara claimed by Tunisia, and had attacked a small post during the night of 20-21 July. The garrison had been relieved by French aircraft which the Tunisians said dropped napalm. A ceasefire took effect at the same time as the one at Bizerta.

The role of the United Nations in ceasefire arrangements should be noted. Early on 20 July, Tunisia asked for an emergency meeting of the UN Security Council. The Council, on 22 July, passed a resolution calling for a ceasefire, withdrawal of both sides to their original positions, removal of the French forces that had been brought in from outside Bizerta, and negotiations toward a settlement. However, France had called for a ceasefire before the Security Council resolution was passed. It put one into effect after the resolution was passed, but made it clear in a number of ways (see Comment, below) that French actions were initiated by France, not dictated by the UN.

Conflict Apparently Initiated by Tunisia.

The conflict seems not to have been deliberately sought by either side, but rather to have escalated by steps to a brief war. However, the barricading of the French base by 10,000 civilian volunteers, their taking French soldiers prisoner, and, especially, Tunisian batteries firing on French transports bringing reinforcements, appear to mark the initiation of hostilities.

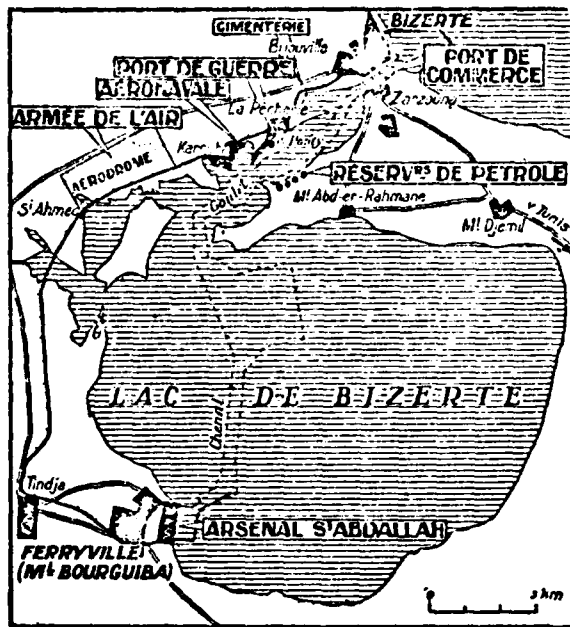
Probable Goals - Tunisia

To gain control of the Bizerta base, with the underlying purpose of extending Tunisian sovereignty over all territory within the country's borders.

Probable Goals - France

Maintenance of French control over the Bizerta base; maintenance of the security of French personnel on the base;

MAP 1



The Bizerte Base, showing French military installations.

MAP 2



The shaded area indicates Tunisian territorial claims in the Sahara.

Source: Le Monde, Paris. Used with permission.

demonstration that France could not be intimidated and could project power effectively and at will.

Terrain and Climate

Flat, urban; warm and dry.

Manpower Committed - Tunisia

An estimated 3,200 Army and National Guard troops, plus 10,000 civilian volunteers, of whom at least 1,000 are estimated to have been lightly armed.

Manpower Committed - France

Approximately 4,800 ground troops (2,400 non-technician members of the garrison, plus three 800-man regiments flown in from Algeria). In addition, there were an unknown number of naval personnel, including airmen, and marine paratroops.

Weapons Committed - Tunisia

Tanks: None mentioned in accounts

Artillery: Yes, including antiaircraft weapons

Aircraft: None mentioned in accounts

Naval vessels: No

Weapons Committed - France

Tanks: Yes

Artillery: Yes

Aircraft: Bombers, fighters, helicopters, transports

Naval vessels: 3 cruisers, 1 aircraft carrier

Casualties - Tunisia*

Killed: 650 (an average of differing figures)

Wounded: 1,500 (an average of differing figures)

* Tunisian casualty figures include Army and National Guard troops and armed civilians.

Captured: 696

Total: 2,846

Casualties - France

Killed: 27

Wounded: 133

Captured: 32

Total: 192

Weapons Losses - Tunisia

Not known.

Weapons Losses - France

Not known.

Rates of Advance - Tunisia

Not applicable.

Rates of Advance - France

Not relevant; French took town of Bizerta easily in one day.

Goals Achieved? - Tunisia

No. However, within three years Tunisia had completely achieved its goals, presumably partly as a result of this military conflict.

Goals Achieved? - France

Yes. However, in 1962 France relinquished its claims to naval and air installations at Bizerta, and within the next few years all French rights and presence at Bizerta were phased out.

Winner?

France

Loser?

Tunisia

Predict Point

Relative strengths made it clear before hostilities began that France could easily defeat Tunisia, if it chose to commit its full resources. Total French armed forces were about four times the size of Tunisia's, Tunisian weapons inventories were insignificant in comparison with those of France, and France had ample means to project force by air and sea. However, although the outcome would seem to have been obvious, France had just fought a long, unsuccessful war against Algerian separatists, and other wars since have shown that a stronger nation does not necessarily succeed against a weaker adversary, especially if there is an opportunity for that adversary to receive help from outside. Thus, it was the immediate French decision to use adequate force -- three airborne regiments, three cruisers, and an aircraft carrier in addition to troops already on the scene -- that establishes the Predict point at about noon of 19 July.

Quit Point

22 July. Ceasefire negotiations opened at 8:00 PM; Tunisia ordered a ceasefire at 9:30.

Comment

This was a war in which the victor seems to have gained very little of lasting value. However, once the barricades went up, it would have been difficult for France to make any decision except the decision to fight. That decision was made promptly, military operations were carried out effectively, and France achieved a successful termination phase of remarkable brevity. France's avoidance of any but moral support to Tunisia from outside powers, largely as a result of the brevity of the conflict, should be noted.

The interaction of France with the United Nations at the end of the termination phase is of interest. The UN voted a resolution calling for a ceasefire and restoration of the status quo ante, i.e., France's withdrawal from the town of Bizerta, on the evening of 22 July. It was almost immediately after this vote that France announced that a ceasefire had been ordered. However, France took a number of steps to demonstrate that its action was not taken in acquiescence to UN action: (1) It did not withdraw from Bizerta; (2) It had not participated in the initial UN meetings on the Bizerta crisis, and it boycotted a special General Assembly session on the crisis (7 August); (3) Its foreign minister, M. Couve de Murville, stated on 26 July that France had ordered the ceasefire "when, as you know, the French forces had attained their objectives," making it clear that the ceasefire was not declared in obedience to the UN resolution; (4) When UN Secretary General Dag Hammarskjold visited Bizerta, 26-27 July, the French forces pointedly refrained from saluting him, searched his car (which was flying the UN flag) for arms, and in general showed him no marks of respect. (This does not, of course, necessarily mean that France was uninfluenced by UN action.) France's behavior vis-a-vis the UN, along with its speedy and forceful military action, made the statement that it regarded its right to defend itself against threats to its security as lying outside the authority of any other entity, including the UN.

Within a few years, without further fighting, Tunisia had achieved its primary goal -- complete sovereignty over and control of the Bizerta base and its installations; France had relinquished all the tangible assets it had fought for. It did retain, however, the image of a country able to carry out swift and effective military operations and a country willing to use force to achieve ends it deemed essential. Along with enhancement of this aspect of national image, France suffered damage to its image in that it

appeared to have behaved brutally, especially because there were many atrocities (primarily bound prisoners shot) that seem to have been well documented.

Tunisia was embarrassed by the strong French response because of its earlier cordial relations with France, and Francophone African states of the Brazzaville group were pushed away from solidarity with France. On the other hand, the lesson of France's military effectiveness was undoubtedly not lost on the African states, and a French military presence in Africa continues to be valued by African states seeking national security and regional stability.

France, in agreements of June and November 1962, relinquished its claims to the naval and air facilities at Bizerta, and evacuated its personnel in December 1963. French rights and the French presence at Bizerta were phased out completely during the next few years. The Soviet Union now has an agreement with Tunisia permitting it to use the base's naval repair facilities.

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CHINA-INDIA WAR, 1962

Dates

20 October - 21 November 1962

Summary of Conflict

There were long-standing border disputes in two areas along the boundary between India and China: to the west in the Ladakh region, between India (Kashmir) and China's Sinkiang Province; and to the east, in the NEFA (Northeast Frontier Agency) area, where the McMahon Line had been drawn in 1914 between India and Tibet. (See Maps 1 and 2.) In early 1960, the Indian government began a "Forward Policy" of setting up new posts in the disputed areas, in order to establish an Indian presence there. A new Indian post placed in 1962 on the Chinese side of the McMahon Line (but on the Indian side of the mountain ridge that the Indians believed was the boundary intended as the McMahon Line boundary) apparently precipitated a Chinese decision to push the Indians decisively back.

In September the Chinese began putting pressure on the Indian forward posts, and on 20 October they launched offensives in both NEFA and Ladakh, advancing quickly against outnumbered and inadequately prepared Indian resistance. On 24 October the Chinese made peace proposals, which essentially repeated earlier offers to withdraw their military forces 20 kilometers behind the "line of actual control" existing in November 1959, before India began its "Forward Policy" -- if India would do the same. This would have established a demilitarized zone straddling the border. India refused to negotiate under the guns of a Chinese invasion. All sectors of Indian public opinion, including the Communist Party, rallied to support the government, and India began to receive weapons from Britain, the United States, and other Western powers. The Soviet Union took a neutral position. The world press generally portrayed China as committing unprovoked aggression,

and the Chinese government worsened its propaganda position by claiming that India had actually launched a massive invasion, a transparent falsehood.

The Indians had to decide where to stop their retreat and hold. An initial decision by corps headquarters to hold at Bomdi La, judged the first position at which the Indians could expect to build up faster than the Chinese, was changed by the government, following arguments by officers at army headquarters that the 14,600-foot pass of Se La, which was closer to the border and thus preferable politically, was impregnable. (See Map 3.)

The Chinese had followed up their initial advances by rapidly building a military road from the McMahon Line to Tawang, 12 miles away as the crow flies, but much farther in actual distance over jagged mountain ridges up to 17,000 feet. Working 24 hours a day, the Chinese laborers reached Tawang early in November, and then began improving the Indian road from Tawang to Se La. A Chinese battalion meanwhile made its way by an old trail, which bypassed "impregnable" Se La, to the road between Se La and Bomdi La, cutting the supply line of the Indian brigade at Se La. Confusion in decisions and orders led to a poorly executed Indian attempt to withdraw from Se La on 18 November; the brigade was destroyed and its commander killed, although the bulk of its men eventually made their way back to Indian-held territory. Two other brigades, including the one defending Bomdi La, also disintegrated during 18 and 19 November, under the hammering of Chinese attacks and the confusion of ineffective plans and contradictory orders.

Meanwhile, Walong, at the other end of the McMahon Line, had fallen on 14 November, although the news was not reported in the Indian press until 18 November, presumably because a much-publicized Indian offensive had been attempted in this area.

On the night of 19 November, the corps commander in the NEFA area, believing the Chinese intended to push on toward the Assam

plain, and that nothing could stop them short of the Brahmaputra River, ordered his headquarters to move 100 miles west, across the river, to Gauhati. (See Map 4.) The evacuation of Tezpur, the original corps headquarters and a town of 24,000, was carried out with great confusion on 20 November. Government papers and currency were burned, and residents poured out of the city as refugees from parts of NEFA already overrun by the Chinese poured in.

The Chinese had by this time advanced a total of 100 miles south of the McMahon Line. To the west, in Ladakh, they had made more modest advances, occupying all the Indian border posts lying in areas they claimed.

Just after midnight on 21 November, the Chinese government announced that its troops would observe a ceasefire, beginning in 24 hours. They would then withdraw to a line 20 kilometers behind the "line of actual control" of November 1959, which was, as the Chinese announcement made explicit, the McMahon Line. They described the line as "illegal," making it clear that they still claimed additional territory, although they were not going to occupy it. They stated that the Indians were also to observe the 20-kilometer rule. Thus a 40-kilometers-wide demilitarized zone would be established to buffer the China-India border.

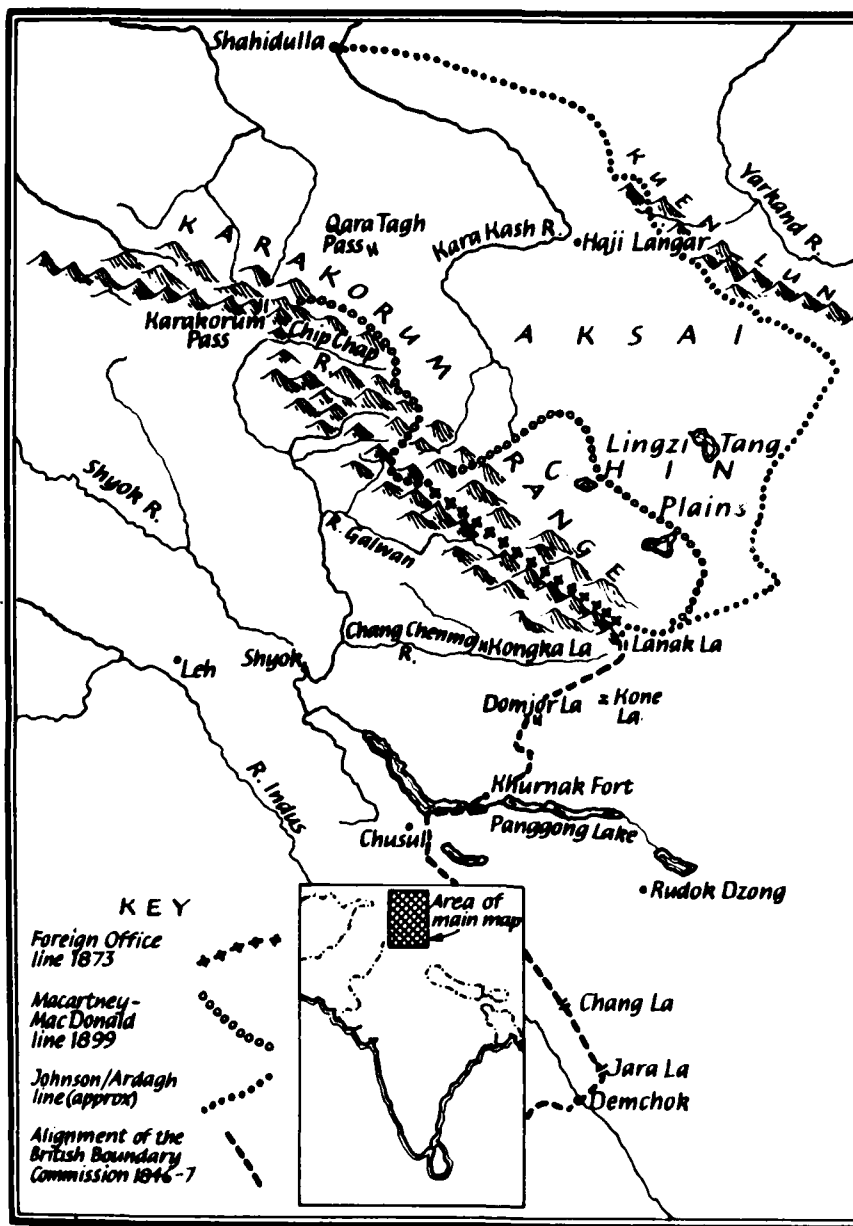
The Chinese declaration was met with disbelief and suspicion by the Indian government, but was tacitly accepted. The Chinese withdrew as they had said they would, meticulously returning to the Indians all weapons and equipment abandoned in the hasty retreat. The border arrangement has remained substantially the same since the war.

Conflict Apparently Initiated by China

Probable Goals - China

Clearing Indian troops from border areas claimed by China; stabilizing borders; demonstrating Chinese military capabilities.

MAP 1

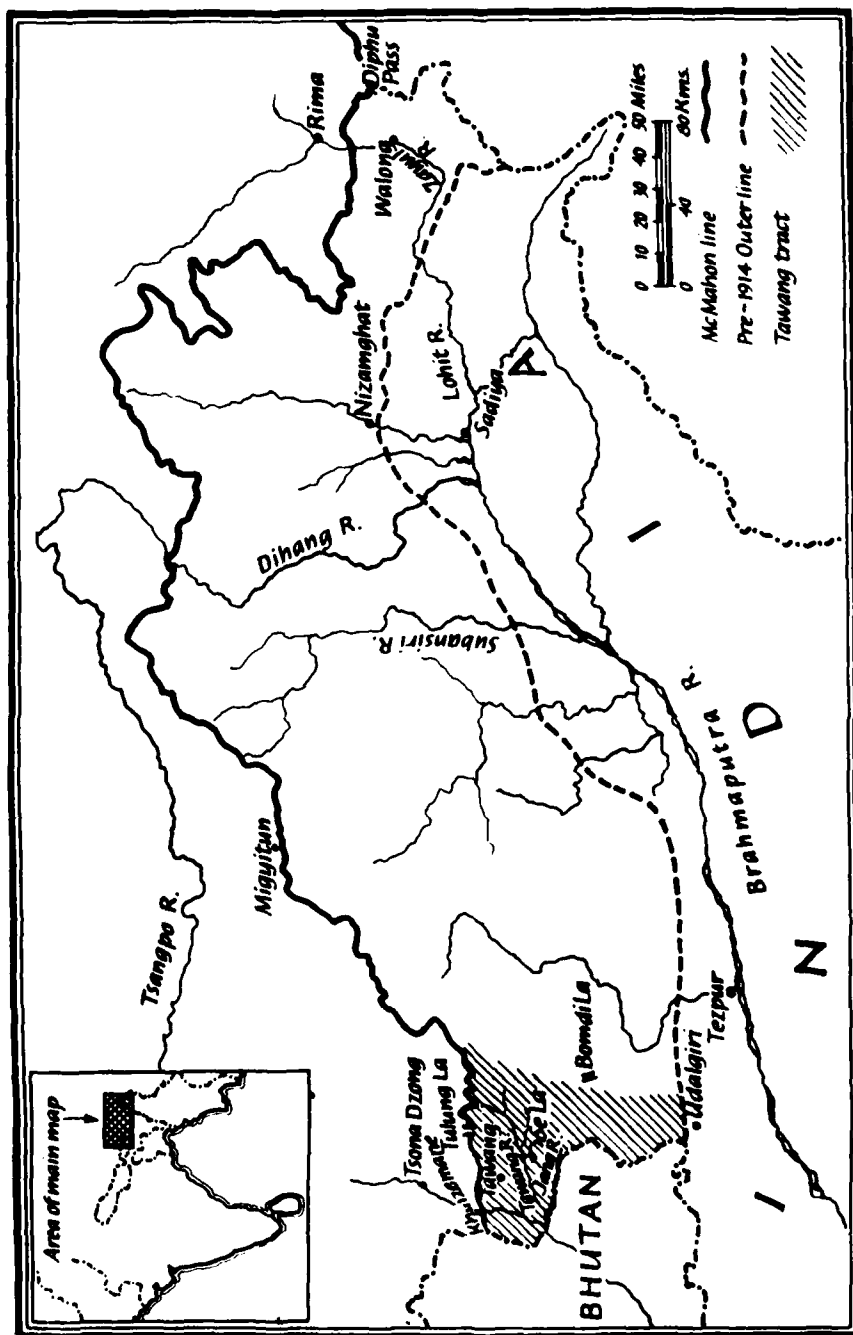


Historical development of western sector boundary

Source: Maxwell, India's China War, following p. 18.

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MAP 2

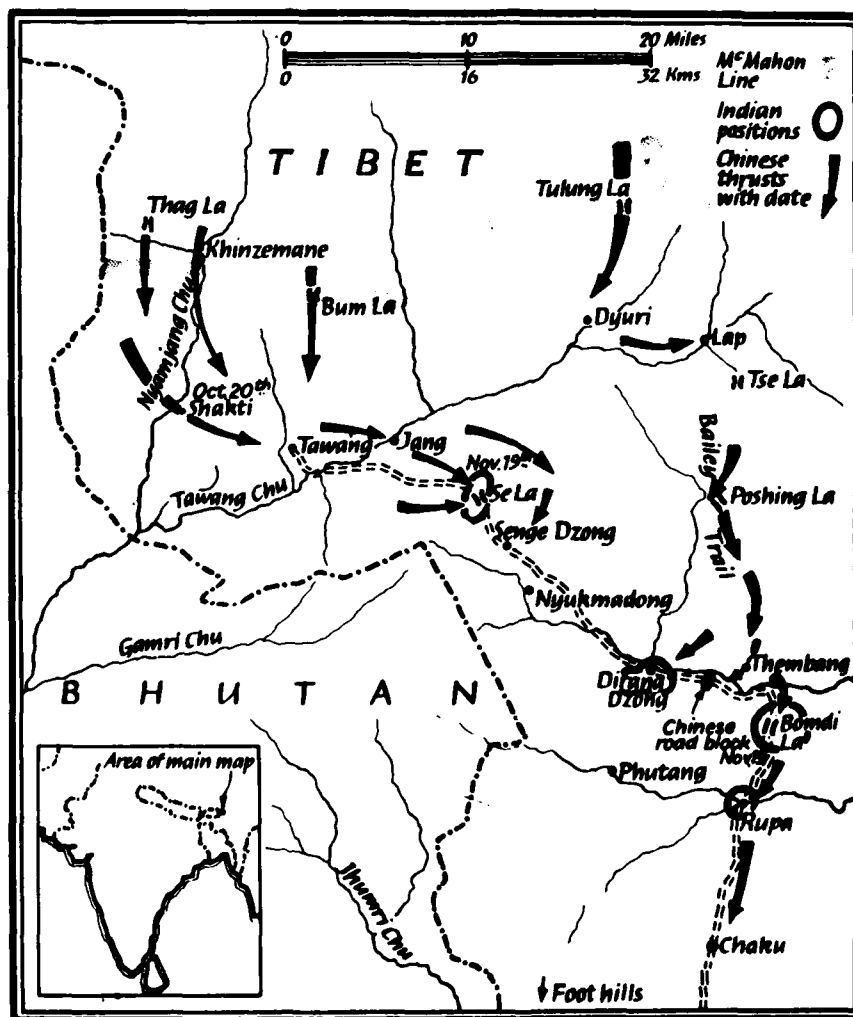


Historical development of eastern sector boundary

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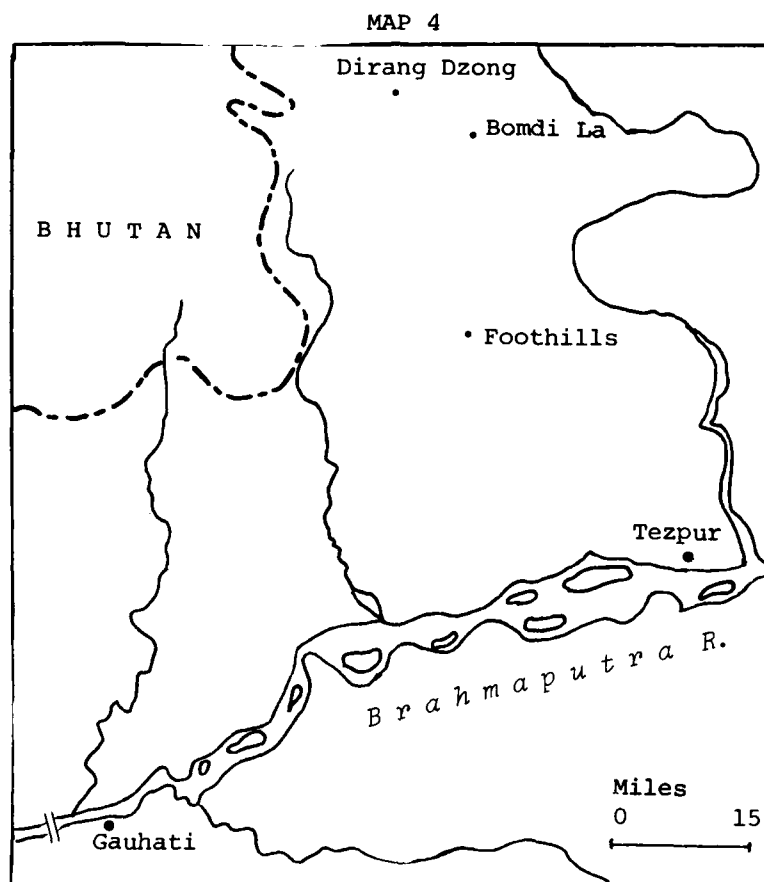
MAP 3



The battle of NEFA

Source: Maxwell, India's China War, following p. 290.

Used with permission of Pantheon Books.



The Chinese advance stopped a few miles north of Foothills.

Probable Goals - India

Initially, holding border areas claimed by India; later, defending Indian territory against extensive invasion.

Terrain and Climate

Rugged mountains, high altitude (to 17,000 feet); sub-freezing temperatures.

Manpower Committed - China

Three infantry divisions* in NEFA (Northeast Frontier Agency, where most of the fighting took place)

Manpower Committed - India

Twenty-five infantry battalions (three infantry divisions [-])* in NEFA.

Weapons Committed - China

Tanks: Yes, in Ladakh only

Artillery: Yes, including 120mm mortars and mountain guns

Aircraft: No combat aircraft

Weapons Committed - India

Tanks: No

Artillery: Yes; 25-pounder light artillery at Se La

Aircraft: No combat aircraft; transport and reconnaissance aircraft used.

* These are Maxwell's comparisons. He suggests that the Indians were only slightly outnumbered overall but were so widely dispersed that they were usually greatly outnumbered in any given action.

Casualties - China*

Killed and wounded: No figures. Both India and China stated Chinese losses were heavy.

Captured: None.

Casualties - India*

Killed: 1,383

Missing: 1,696

Captured: 3,968 (26 died of wounds; remainder repatriated)

Total: 7,047

Weapons Losses - China

Not known.

Weapons Losses - India

Not known; considerable; weapons and equipment abandoned during the retreat were later returned by China.

Rates of Advance - China

100 miles total advance on NEFA front in 32 days of hostilities, of which 14 were days of active fighting and/or advance.

90 miles advance in one 3-day period.

Rates of Advance - India

Not applicable.

Goals Achieved? - China

Yes.

* Maxwell, pp. 424-25. Maxwell states that 90% of Indian casualties were suffered in NEFA.

Goals Achieved? - India

No. "Forward policy" of posts and patrols up to China-India border, as defined by India, was abandoned. However, India suffered no significant loss of territory, since China's goals apparently did not include annexation of Indian territory.

Winner?

China

Loser?

India

Predict Point

Not clear. There was a lull in the fighting, after the initial Chinese assaults, that lasted from 28 October through 14 November. It should have been clear by 28 October to a fully informed outside observer that the Indian troops and commanders were not prepared to fight effectively against a determined Chinese force under the terrain and weather conditions of the combat zone. Although the strength of total reserves on both sides is not clear, the Chinese, with their much easier resupply and reinforcement situation, clearly had the advantage in reserves for a short war. 28 October may be tentatively identified as the Predict Point.

Quit Point

Winner ended the war on 21 November when its forces were in position for a sweeping and lightly opposed assault into the heart of India. The decision to stop at this point was probably made before the war began. Although India protested the Chinese terms, there was no military action by either side after 21 November. Chinese forces began withdrawing on 1 December. India tacitly accepted the Chinese terms; it is not possible to pinpoint

a date when it acknowledged that the war had ended, but 21 November was the effective Quit point.

Comment

Although the Chinese goal was not clear to the Indians, nor to the rest of the world at the time of the invasion, it seems to have been extremely simple: a stable frontier with India, free from Indian probes, threats, and encroachments. Rather than responding to Indian moves with counter probes and threats, the Chinese conducted a large-scale, well-planned operation that made clear their capabilities in the region, and then declared a settlement on the terms they had sought before the war began. They did not continue to occupy land which they claimed, which they had conquered, and which they might have been expected to hold, at least as a bargaining chip for negotiations.

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INDIA-PAKISTAN WAR, 1965

Dates

1-23 September 1965

Summary of Conflict

Since 1947, when the largely Moslem state of Jammu and Kashmir became part of largely Hindu India instead of becoming part of Moslem Pakistan, Kashmir has been a source of conflict between India and Pakistan. Border incidents all along the frontiers increased in 1964 and early 1965, and in April 1965 fighting broke out in a disputed area of the Rann (desert) of Kutch, near the Arabian Sea. This area is not near Kashmir, but both sides massed troops near the border in Kashmir during the fighting. They were withdrawn after a ceasefire in the Rann of Kutch was arranged by British mediation, but in early August the Kashmir confrontation again became inflamed when armed infiltrators moved across the border from Azad Kashmir (the portion of Kashmir within Pakistan) and tried to bring about a revolt in Kashmir against the Indian government. The revolt did not materialize. Beginning on 16 August, Indian forces occupied several points on the Pakistan side of the 1948 ceasefire line, stating that they were doing so to prevent further infiltration. Then, on 1 September, Pakistan attacked into Jammu, to the south

of Kashmir, threatening to drive a wedge between India and Kashmir. The Indian Army then invaded Pakistan in three sectors, on 6-8 September. Three tank battles were fought, two of them the largest since World War II, involving several hundred tanks. Both sides carried out bombing attacks on military targets, several air engagements were fought, and close air support was provided to ground forces by both sides.

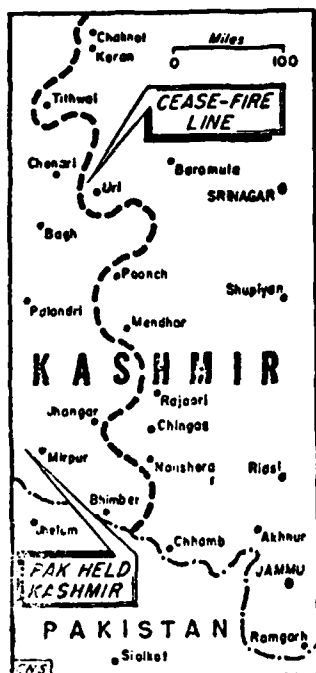
The most clear-cut tank victory was that of the Indians on the Lahore front (see Map 2), near Khem Karan, India, 10-11 September. Indian forces that had advanced into Pakistan met so little resistance that they pulled back across the border, fearing a trap. Pakistani tanks pursued them and were themselves trapped as they attacked the Indians' horseshoe-shaped defensive position without adequate reconnaissance. The Indian center gave way, while the flanks held, and knocked out about one-fourth of the Pakistani tanks, which had bogged down in the mud that lay below the surface crust of the terrain.

The other large-scale tank battle took place on the Sialkot front, 11-15 September, with heavy losses and inconclusive results; India apparently had a slightly favorable tank-loss ratio. Heavy but inconclusive fighting continued on this front until the ceasefire.

The UN Security Council had worked throughout the fighting for a ceasefire, and India agreed to a ceasefire on 16 September, reserving the right to carry out operations against infiltrators in civilian clothes. Pakistan refused at that time to accept a ceasefire unless a plebiscite in Kashmir within three months was part of the agreement.

A new UN resolution was adopted on 20 September; basically, it called for a ceasefire and urged negotiations toward a settlement. India accepted promptly, while Pakistan protested that the resolution did not deal with the basic problem, the future of Kashmir. The following day there were large (involving 30,000 people), violent demonstrations in Karachi, then the Pakistani

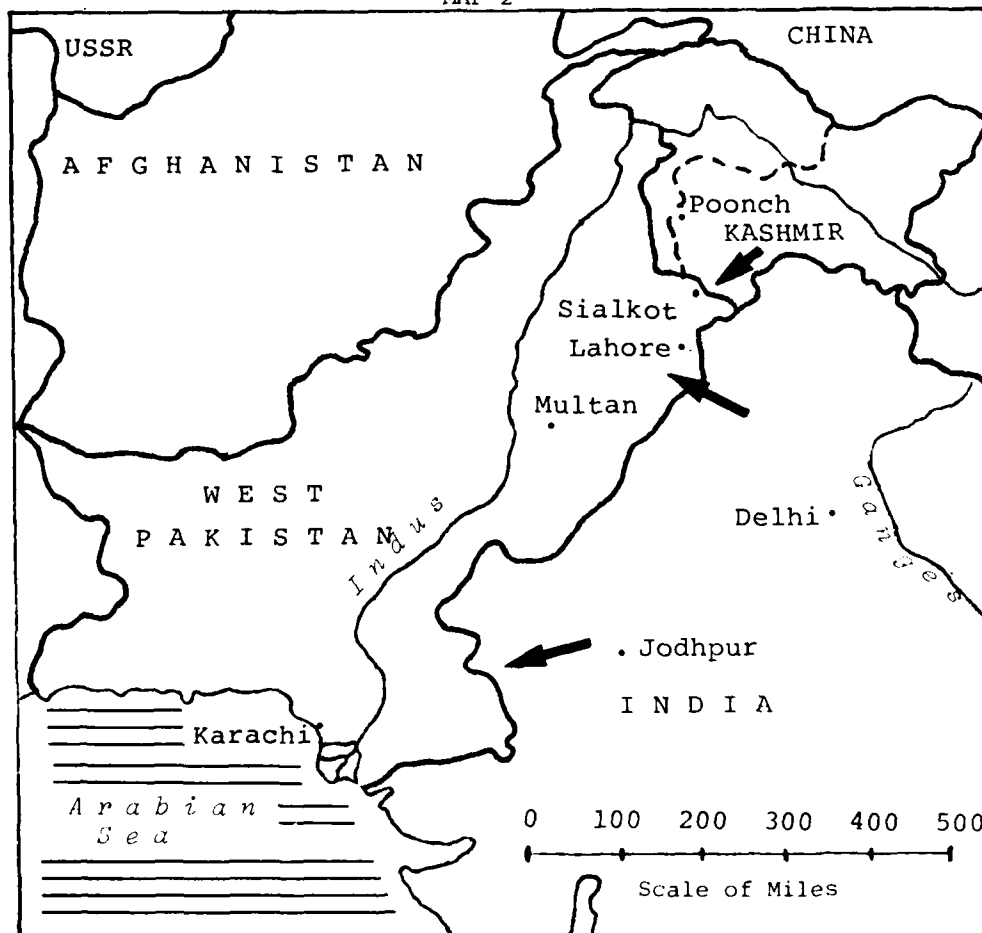
MAP 1



The Cease-fire Line in Kashmir.

Reproduced from
The Hindu, Madras
(August 11, 1965).
Used with permission.

MAP 2



The arrows indicate Indian armored attacks into Pakistan.

capital, against the UN, United States, and other Western countries. Early on 22 September, Pakistan announced at the UN that it had ordered a ceasefire.

Conflict Apparently Initiated by Pakistan

Probable Goals - Pakistan

Incorporation of Indian Kashmir into Pakistan. Testing troops and weapons?

Probable Goals - India

Retention of Indian Kashmir as part of India. Testing troops and weapons?

Terrain and Climate

Flat. Two tank battlefields were on the hot, dry, featureless Punjab plain. The third was also flat, but had small water courses, standing water, and mud under a hard surface crust.

Manpower Committed - Pakistan

About 90,000.

Manpower Committed - India

About 100,000.

Weapons Committed - Pakistan

Tanks: About 600, including US M47 Pattons and older M4 Shermans.

Artillery: Yes; quantities not known.

Aircraft: Yes, including F-86 Saber jets; quantities not known; see Weapons Losses.

Note: Naval warfare negligible.

Weapons Committed - India

Tanks: About 600, including British Centurions and older M4 Shermans.

Artillery: Yes; quantities not known.

Aircraft: Yes, generally older types than Pakistani; quantities not known; see Weapons Losses.

Note: Naval warfare negligible.

Casualties - Pakistan

Killed: 2,800*

Wounded: 8,700 (estimate)**

Captured: 1,600 (estimate; includes missing)**

Total: 13,100

Casualties - India

Killed 2,700

Wounded: 8,400

Captured: 1,500 (includes missing)

Total: 12,600***

Weapons Losses - Pakistan

Tanks: About 200.

Artillery: Not known.

Aircraft: About 20.

Weapons Losses - India

Tanks: About 110

Artillery: Not known.

Aircraft: About 65.

* Estimate based on average of Indian claims (4,802) and Pakistani admissions (830). Keesing's, p. 21108.

** Estimate based on assumption that ratios of Pakistani killed to Pakistani wounded and captured were similar to Indian ratios.

*** Casualties admitted by India. Blinkenberg.

Rates of Advance - Pakistan

Advances were generally limited, on wide fronts. US observers stated that Pakistan occupied 310-320 square miles of Indian territory.

Rates of Advance - India

Advances were generally limited, on wide fronts. US observers confirmed India's claim to have occupied 720 square miles of Pakistani territory.

Goals Achieved? - Pakistan

No, assuming goal was incorporation of Indian Kashmir into Pakistan. Pakistan did demonstrate its ability to fight India to a virtual stalemate.

Goals Achieved? - India

Yes, assuming goal was retention of Indian Kashmir. India stopped the Pakistani invasion of Kashmir, averted Kashmir's being cut off from India by a Pakistani thrust toward Akhnur (see Map 1), and, by means of its assault in the Punjab, destroyed Pakistani tanks and other equipment on a large scale. It also demonstrated that it did not have as a goal destroying Pakistan or conquering Azad Kashmir (the part of Kashmir in Pakistan).

Winner?

India

Loser?

Pakistan, primarily because it was running out of spare parts for its tanks.

Predict Point

Probably 15 September, at the close of the second phase of the Sialkot-Phillora tank battle; some 600 tanks were involved in

this battle and both sides lost heavily. Both sides were influenced to end hostilities, and the Pakistanis, especially, were faced with losses they could not expect to replace. The Indian forces took Phillora about 15 September and agreed to accept a ceasefire on 16 September.

Quit Point

22 September, when Pakistani Foreign Minister Bhutto announced Pakistan's acceptance of a UN call for a ceasefire.

Comment

A few comments may be made about the initiation and conduct of the war, before the termination is discussed. In 1965 India was in the process of building up its armed forces, following its humiliating defeat by China in 1962. Some commentators have suggested that Pakistan's initiation of hostilities in 1965 was a preemptive effort to avert an expected strike by an India that was constantly growing stronger, or perhaps an effort to gain Kashmir before India became too strong to be attacked.

Although India so greatly outnumbered Pakistan in troops (800,000 to 200,000 in total armed forces), it was unable to concentrate an overwhelming force against Pakistan, because of the need to keep sizable forces near the Chinese borders, in Nagaland (where there was a serious separatist revolt), and in Sikkim, a strategically located Indian protectorate. Just as India had the greater numbers of men, Pakistan was acknowledged to have superior weapons -- Patton tanks and F-86 Saber jets. However, the way in which the tanks were handled in this war seems to have been more important than technological superiority. Indian battle leadership was generally better, although both sides seem to have committed their armor without adequate reconnaissance.

The role of the UN in providing the machinery for war termination may be seen in this as in other post-World-War-II conflicts. It appears that India believed it had achieved its goals and was

ready to terminate following the main phase of the great tank battle near Sialkot and Phillora. It accepted the UN ceasefire resolution on 16 September. Another week of fighting took place before Pakistan agreed to a ceasefire. No sudden, strong blow, or significant territorial loss took place during the week. If the level of Pakistani casualties reached a point that determined its surrender during that week, it is surprising that India, with somewhat lighter casualties, and considerably lighter casualties in relation to population and to manpower committed, was ready to terminate one week earlier. It seems likely that during the week of 16-23 September Pakistan assessed its ability to continue fighting, given an embargo the United States had imposed on arms to both sides, and decided to stop fighting. India produced much of its own materiel, while Pakistan was at that time completely dependent on the United States for spare parts for its tanks.

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SURVEY OF THE LITERATURE ON WAR TERMINATION

In looking at the literature on war termination, it is important first to define and set boundaries on what should be included under this heading. Several writers on war termination have stressed how little has been written on the subject,* and this is strikingly true if one compares the vast literature on the "causes of war", with the slim volume of work devoted to the endings of wars. However, at least one writer has suggested that there is in fact a very large literature on war termination, since much of the work subsumed under the heading "diplomatic history" actually deals with war termination.**

The present report focusses on war termination as the ending of armed hostilities, and on the termination phase of a war as that period of the war in which military, economic, psychological, political, and diplomatic factors are combining to precipitate an ending whose general characteristics are already reasonably clear. In other words, when the termination phase begins, it is reasonably clear which side will achieve more of its war aims and will have more power in setting peace terms; what the termination phase decides is how quickly and in what manner the war is brought to an end. Post-hostilities diplomacy, including the negotiation of peace treaties, is not included in this definition of termination. Therefore, diplomatic histories are generally only marginally relevant for consideration of war termination, understood in this sense, and are not included in this literature survey.

The basic question about war itself is "Who will prevail?" That question could theoretically be answered if one knew the total military, economic, political, and psychological resources of both sides -- numbers and quality of weapons, numbers of troops, training, leadership, industrial base, strength of internal public support,

* See, for example, Ikle, Every War Must End, p. v.

** Handel, War Termination, pp. 12-15.

and so forth, and could weight them all correctly. However, the basic war termination question would still remain: "When will the war end?" It is this question that war termination literature, as understood in this report, addresses.

Most of the works listed and discussed below do address the question, that is, they do attempt to find some means of predicting when a given war is likely to end. A few others have been included because they are useful for background material. All those dealing explicitly with war termination have been published since World War II; a majority of them seem to have been produced in response to the protracted Vietnam War.

The reader may note that most of the works that seek a basis for predicting war termination fall into one of two categories: those that seek an indicator, such as a mathematical relationship between average casualties in individual battles and total casualties in wars; and those that seek a multifactor model that presents all the factors affecting war termination. The first group seeks a statistical pattern that can make possible prediction in future wars, while the second group seeks to understand the interaction of forces that bring about war termination, also with the ultimate aim of prediction. Neither group has been successful in achieving the ability to predict, but the works as a whole provide a starting point for anyone approaching this relatively new field.

CALAHAN, H.A. What Makes a War End? New York: Vanguard Press, 1944.

The author, a Naval Reserve officer writing near the end of World War II, uses a case-study approach, examining the endings of nine historical wars. He divides these wars into those that ended when the loser's war aims were no longer worth the price of continuing the war and those that ended when further resistance was impossible. Admitting that these are somewhat imprecise and overlapping categories, he nevertheless believes there is a real difference between terminations that come because someone is getting hurt

and terminations that come because someone can't go on. He finds that the decision to quit was almost always brought about by military pressure, and that the most effective military pressure was to destroy the enemy's force as a force (not necessarily physically destroying a large proportion of enemy troops). Calahan sees attrition (in the sense of continuing casualties) as significant but not immediately decisive. "Of course, there can be no war without attrition. But for attrition to bring about the end of resistance, the balance of forces must be suddenly and overwhelmingly disturbed. [Emphasis added.]" (p. 230) He believes attrition cannot be an indicator of approaching surrender, noting that France lost 600,000 men at Verdun and held that fortress, "but in the Battle of France in World War II, she lost 50,000 men and gave up her entire country." (p. 230) He notes that the surrender of a large army is often decisive, while steady attrition is not so effective, since losses can be made up. On the other hand, "steady attrition, especially when administered by a foe that conserves his own forces, tells in the long run." (p. 231)

CANNIZZO, Cynthia A. "The Costs of Combat: Predicting Deaths, Duration, and Defeat in Interstate War, 1816-1965." Paper delivered at the International Studies Association Convention, Washington, D.C., February 1975. Revised for publication, December 1975. (The author was associated with the Mental Health Research Institute, University of Michigan.)

This paper presents an effort to formulate a statistical model of warfare. Since duration of war and relative casualty levels of the two sides are among the parameters treated, the paper is relevant to a consideration of war termination. Cannizzo hypothesizes that the "costs of war" -- duration, relative loss ratio, and defeat -- are interrelated and jointly dependent on the relative strength of the two opposing sides. (pp. 2-3) She places

wars on a continuum of which the extremes are, on the one hand, the "rout" and, on the other, the "war of attrition." In the rout, "one side has a preponderance of capabilities, and is able to bring this strength to bear so that: (1) the war is short; (2) the stronger side suffers fewer deaths in relation to strength; and (3) the stronger side wins the war." (p. 3) In a "war of attrition," the sides are approximately equal, which predicts "a long war, approximately equal loss rates, and victory depending upon external, or qualitative factors." (p. 3) The paper's basic findings are the following:

(a) the greater the initial numerical superiority one nation has, the less its relative losses;

(b) the greater the initial numerical superiority, the shorter the war;

(c) the greater the initial numerical superiority, the greater the probability of victory for the stronger nation;

(d) the longer the war, the lower the probability of victory for the stronger nation;

(e) the greater the relative losses suffered by the stronger nation, the less the probability of victory for that nation; and

(f) the greater the relative losses suffered by the stronger nation, the longer the war.

CARROLL, Berenice A. "How Wars End: An Analysis of Some Current Hypotheses." Journal of Peace Research, 1969, No. 4, pp. 295-321.

Carroll's work, including this paper, probably constitutes the best introduction to war termination research, since she intelligently and objectively discusses a wide range of approaches to war termination.

Many of the authors whom Carroll discusses are listed in this bibliography, and their work is described at the appropriate entry. Two who are not listed herein, because their work was not readily available, are Lewis Coser and Lars Porsholt. Carroll's comments on this work are summarized below:

Coser sees what he calls "markers" as significant in precipitating war termination. The markers are taking of a fortress, reaching a natural barrier, and taking a capital city in cases where this has special symoblic value. Coser belives that when an advancing side achieved these markers, at least in limited wars of the past, this presaged the defeat and surrender of the other side.

Porsholt developed inequality formulae for conflict which can be readily modified for war termination. The formulae are:

$$- M + pG \leq 0$$

and

$$- \bar{M} + p\bar{G} \leq 0$$

where $-M$ and $-\bar{M}$ are the disutility of the costs of the war to the two sides, G and \bar{G} are the gain each side seeks, and p is the probability of achieving the gain. This is simply the mathematical expression of the statement that a country will continue fighting as long as the expected gain outweighs the cost. Note that both sides must have decided that further effort is not worth the cost if the war is to stop; both mathematical statements must be true.

Carroll suggests that Porsholt's work is a good place to begin estimating rational-calculation approaches to war termination, but notes the static quality of the formulae. There is no provision for changing aims within a war, and no account taken of the importance and difficulties in communication between adversaries. Suppose both sides reach the situation described by the formulae, but neither knows that the other has done so?

Carroll also discusses Quincy Wright's escalation formula, which can be adapted for war termination. (pp. 309-13)

. "War Termination and Conflict Theory: Value Premises, Theories, and Policies." The Annals of the American Academy of Political and Social Science, Vol. 392 (November 1970), How Wars End, pp. 14-27.

In this paper, Carroll discusses work on war termination by investigators of the "conflict resolution" school. She divides these writers on war termination into three categories: (1) those who treat war as gamelike -- decisions are made on a rational basis, as in chess; (2) those who treat war as fightlike -- the two sides have at each other, exchanging blows, reacting to the adversary's actions; (3) those who treat war as a product of many interacting factors that may produce fightlike or gamelike behavior, or a combination of both.

Among the "fightlike" theorists, Carroll groups Lewis Richardson, Frank Klingberg, and John Voevodsky. She summarizes Richardson's 1948 paper that presented his "war moods" theory. He saw war as following an epidemiological model. A war fever develops, spreads, and intensifies, and then eventually war weariness sets in. When about half of the survivors are unwilling to continue, the war ends. Richardson saw war's development and termination as a deterministic process, and saw little that leaders making strategic, rational decisions could do to alter it. He saw costs, including casualties and civilian hardships, as determining termination; when costs are high enough to convert about half the population to war weariness, the war ends. His chief case study, apparently, was World War I. (See also bibliographic entry for Rapoport, below.)

Klingberg and Voevodsky both looked for a relationship between casualties and war termination. Carroll dismisses Klingberg's work briefly, pointing out that he made few claims for it, but discusses Voevodsky's at some length. She points out that he really deals only with US behavior, and in only five selected wars. (See bibliographic entries on Klingberg and Voevodsky.)

Among the "gamelike" theorists, Carroll lists Nigel Howard, Thomas Schelling, and Walter Isard. She summarizes their views, which have to do with strategies employing threats to the enemy to fight on, combined with simultaneous threats to one's allies to

quit, with war termination theoretically resulting. Their theories, Carroll says, are all based on a logical problem called the "prisoner's dilemma," which posits a situation in which the interests of the players are not in conflict. They do not take real issues between the combatants into consideration, and thus do not fit most wars.

Carroll herself seems to fall into the third of her categories. She presents a first attempt at a multifactor model that would represent the many military, political, diplomatic, and psychological factors that influence the decision to terminate a war, and she tries to make it a dynamic model, providing for change and interaction of actors. However, she makes it clear that the model is far from being able to describe past events accurately, much less predict future ones.

FOX, William T.R., ed. How Wars End. The Annals of the American Academy of Political and Social Science, Vol. 392. Philadelphia: The American Academy of Political and Social Science, 1970. (Hereafter cited as Annals: How Wars End.)

A collection of papers, most of which are focused on termination of prolonged, Vietnam-type wars. Several of the papers which seemed relevant for the present study are included separately in this bibliography.

_____. "The Causes of Peace and Conditions of War."
Annals: How Wars End, pp. 1-13.

This like other articles in this book, is written in the context of the Vietnam war, and deals with the model of a major-power combatant bogged down in a protracted limited war from which it wishes to extricate itself. Fox's question is "How can one wind down a limited war?" Thus, the paper is of limited relevance for the present study. Fox does make the good point that "unless one side chooses simply to abandon the field or unconditionally surrenders, it takes two to end a war."
(p. 5)

HANDEL, Michael I. War Termination: A Critical Survey.

Jerusalem Papers on Peace Problems, No. 24. Jerusalem:
The Hebrew University of Jerusalem, 1978.

Handel devotes chapters to the non-rational aspects of war termination, specifically, the role of individual leaders, and to domestic pressures for termination. His focus, however, is on a rational model that seeks the optimal termination point for both adversaries. He explores the cost vs. probable gain approach carefully and develops a flow chart to display the variables and decisions involved. This is a significant and useful work.

HISTORICAL EVALUATION AND RESEARCH ORGANIZATION (HERO).

National Strategic Concepts and the Changing Nature of Modern War. Prepared for the US Air Force Office of Scientific Research. July 31, 1966.

Volume 1, Chapter 9, "Criteria for Success in Contemporary Conflict," is relevant for the present study. Probably the most significant point that emerges from the discussion is the importance of establishing clearly defined overall national objectives as a necessary prerequisite for having clear-cut objectives in a given conflict. Criteria for war termination can then be set on the basis of these war objectives.

IKLE, Fred Charles. Every War Must End. New York and London: Columbia University Press, 1971.

Probably the best known work in the field, and an extremely thoughtful and useful one.

Ikle stresses the importance of termination planning at the onset of war: "For any war effort -- offensive or defensive -- that is supposed to serve long-term national objectives, the most essential question is how the enemy might be forced to surrender, or failing that, what sort of bargain might be struck with him to terminate the war." He points out that once a war starts, objectives tend to escalate, governments change, it

becomes extremely difficult ever to return to the real status quo ante, and the tendency is to go on fighting to settle issues "once and for all."

Ikle does not suggest any relationship between casualties suffered and a decision to end a war. On the contrary, he gives many examples of the widely varying amounts of casualties states have been willing to accept before terminating a conflict. (See, for example, pp. 20-21.) He implies that the most effective actions taken to bring about a decision by an opponent to end a war have been strong, sudden actions with powerful psychological effects. He mentions the German setback on August 8, 1918, with respect to World War I, and the massive Chinese intervention at the Yalu and subsequent Allied rout in the Korean War in 1950. One reason for the impact of such events, he suggests, may be their power to coalesce both government and public opinion.

Ikle devotes a chapter to escalation, and concludes that gradual escalation has generally not been successful in terminating a war. "By and large, when escalation -- or the threat of it -- has succeeded in reversing the enemy's determination to fight on, it has consisted of an extraordinarily powerful move." [emphasis added]. (p. 55)

Ikle gives examples of efforts to force termination, notably the German unrestricted submarine campaign in World War I, that have been unsuccessful and counterproductive. By implication, his suggestion for evaluating proposed measures to influence an opponent to sue for peace would be thorough, sound operations research and systems analysis, carried out by persons who are not advocates of the proposed policy.

KECSKEMETI, Paul. "Political Rationality in Ending War."

Annals: How Wars End, pp. 105-115.

Very clear, useful analysis of the rational bases for a decision to end a war. In modern times, the author points out, wars have often been decided by forces raised while the fighting was going on. "The most crucial decision problems

faced by the belligerents have to do with raising their level of effort by starting new campaigns or committing more resources to war use as against calling off hostilities."

(p. 108) Making the first choice (raising the level of effort) presupposes that the trend of military developments can be reversed. Clausewitz, Kecskemeti points out, has set forth the principle of irreversibility (in a tactical setting): "From the moment . . . when [a commander's] reserves begin to inferior to those of his adversary, the decision must be considered as having been reached. [Emphasis added.] (p. 108)

Kecskemeti does not accept the approach of Lewis Richardson, Kenneth Boulding, and others who see threats of war, preparations for war, and armaments acquisition as themselves the main factor responsible for war. Granting the impact of these factors, he would explain wars' beginnings and ends as resulting largely from the pursuit of political objectives.

In addition to the reversibility/irreversibility principle, Kecskemeti points out that there is the matter of stake vs. costs to be considered. He quotes Clausewitz as saying that the less the stake, the less effort the adversary will make to hold on to it and the less effort one's own side will make to get it. Thus, the motive for going to war will be the measure, not only of the result sought, but of the effort required (p. 109) -- and of the reluctance to terminate with the stake not gained.

However, it is difficult to work with this concept, as Kecskemeti (and Clausewitz) point out. Objectives change during the course of a war. It is also hard to balance war losses against political gains; they are like the proverbial apples and oranges. Furthermore, defining a loss as worth a particular gain is tautological; if the loss is accepted, then the stake must be worth it. Kecskemeti says that a nontautological criterion for evaluating the decision to terminate a conflict is needed. Payoff maximization will not serve the purpose because, as pointed out just above, there is no common measure for political values and war losses.

Kecskemeti points out that ideological conflicts, those in which the other side seems to embody an evil principle and one's own side stands for good world order, necessarily have high stakes and are hard to terminate.

KETTELLE, John D. "Conflict Termination." Paper presented at the Military Operations Research Symposium, Monterey, California, December 3, 1981.

This paper deals primarily with the termination process. It offers a delineation of the steps gone through in war termination: the point at which the outcome is objectively predictable (called the "predict point"); the point at which the outcome is predicted by a significant faction in the "losing" country; the point at which the governing regime of that country predicts the outcome; coups, unsuccessful or successful, in which a faction favorable to war termination seeks control; the governing regime's decision that peace must be made; internal acceptance of terms; external (public) acceptance of terms.

Kettelle suggests using computers and cryptography to imbed a termination process in the process of conflict. Briefly, this proposed termination process would involve a robot "third party" who would know the terms on which each side would be willing to terminate, would not reveal them to the other side, but would be capable of announcing that there was a common basis for termination if this was true. The portion of the paper dealing with this computerized "third party" is not immediately relevant to the present report, but the identification of phases in the approach to termination is useful, as is Kettelle's examination of the phases of Japanese, Italian, and German surrender in World War II.

It may be noted that Kettelle's "predict point" (the point at which an objective, informed outsider could accurately predict the outcome of a war) would appear to be identical with Clausewitz's irreversibility point (the point at which the reserves of one side are clearly inferior to those of the other side).

Kettelle presents another possibly useful concept: his "predictability doctrine." It states that for any conflict whose eventual outcome is predictable, there exists a negotiated settlement better for both sides than any that can be found later if the war is continued. (p. 6)

KLINGBERG, Frank L. "Predicting the Termination of War: Battle Casualties and Population Losses." Journal of Conflict Resolution, Vol. 10, No. 2 (June 1966), pp. 129-171.

This paper grew out of a 1945 effort, carried out for the War Department, to find casualty indices for war termination, with a view to predicting what was necessary to bring about Japanese capitulation. The original task was "to determine to what extent the behavior of the nation in a war can be predicted from the behavior of her troops in individual battles." (p. 130) The original hypothesis, as posed by Quincy Wright, who also took part in the study, was that "the average proportion of battle losses to forces engaged for a defeated belligerent before giving up battles in a given war may have a fixed relation to the proportion of population losses to total population of that belligerent before giving up the war [emphasis in original]." (p. 131) For example, if troops tended to fight almost to the last man before surrendering in a battle, their country might accept very heavy population losses before surrendering to end the war. Klingberg found this hypothesis not supported by the data. No clear pattern appeared. Further, the mean deviation from the average casualties per battle was so great (for the same country in the same war) that the averages seemed to have

little meaning. Especially for limited wars there was no discernible pattern in the ratio between battle casualties before battle surrender and population losses before national surrender.

Klingberg went beyond the original hypothesis, and looked at trends in battle casualties during wars, seeking patterns that would show, during a war, when the war was approaching termination. In other words, he was still looking for indices, but was seeking them in trends over a period of time, rather than in a ratio of average casualties for an entire war. He found some trends that seemed useful, if taken in conjunction with each other. He concluded that most wars seem to end "within a fairly short time after certain significant shifts in trends occur," and noted that these shifts often appear just after a major offensive has failed. Klingberg gives the example of the great German offensive of spring 1918. Klingberg seems to suggest that the most important index is a decline in the size of the armies, often associated with a decline in materiel. Also, there is, near the end of a war, a trend toward higher casualty rates (in relation to the opponent), a higher proportion of military defeats, and an increase in percentages of sick and prisoners. (p. 167)

If one can predict that the end of a war is approaching, and one is on the winning side, what can one do? Klingman suggests that this is the time for a propaganda offensive, which will have little effect earlier. Perhaps it is the time for a strong blow, if this can be carried out without heavy casualties to one's own side. Or perhaps it is the time to wait and focus on offering desirable peace terms, since the signs indicate that the opponent is approaching surrender.

It is important to note that Klingman concludes, "It is impossible to predict accurately during a war how long the war will last." (p. 167). He does point out that periods of intensive warfare do not seem to last more than four or five years. (p. 167)

PARKS, W. Hays. "Rolling Thunder and the Law of War." Air University Review, Vol. 33, No. 2, pp. 2-23.

This article provides a case study for Ikle's discussion of escalation and the kinds of military action that are likely, and unlikely, to precipitate war termination (see bibliographic entry, above). The article's focus is on the air campaign against North Vietnam, "Rolling Thunder," March 1965 - September 1968, and the extent to which restrictions placed by the US Administration and Secretary of Defense on that campaign exceeded the requirements of the law of war. The article also makes clear the changes that political considerations made in military plans for air interdiction, and shows the implications of these changes for the duration and outcome of the war. The Joint Chiefs of Staff selected 94 targets that met all requirements of the law of war as military targets and whose destruction would have, they believed, interdicted the North Vietnamese supply system as a whole. The White House rejected the 94-target list, and, rather than using the campaign for interdiction, used it for an orchestrated program of signals, threats, and incentives. The extraordinary target restrictions, the policy of gradualism in contrast to clearly defined campaign objectives, the intermittent way in which the United States sought limited objectives while the North Vietnamese were waging total war -- seem in retrospect, as described here, to have been conducive to prolonging rather than ending the war.

RANDLE, Robert F. The Origins of Peace: A Study of Peacemaking and the Structure of Peace Settlements. New York: Free Press, 1973.

Randle presents careful classifications and comparisons of peace settlements of modern wars. Although useful as background, this book deals almost entirely with the political and diplomatic aspects of peace settlements. It does not investigate the military conditions that lead to war termination. There is, however, some interesting work on classification of types of wars and war aims.

RAPOPORT, Anatol. "Lewis F. Richardson's Mathematical Theory of War." Journal of Conflict Resolution, Vol. 1 (1957), pp. 249-99.

This is an extremely useful article for understanding mathematical approaches to war and war termination. It presents a clear explication of Richardson's work in this field.

Rapoport describes Richardson's "disease" model of war moods and war termination, stressing that Richardson did not accept the possibility of rational motivation for initiating or ending war. For example, he rejected the idea that the kind of peace terms offered could make a difference in a country's willingness to end war.

Of special interest is Rapoport's critique of Richardson's system (pp. 293-98), in which he questions whether the classical mathematics Richardson uses suits war termination, and whether, in fact, we have a mathematical approach that fits these problems. Rapoport makes clear the inherent difficulties in developing a "fill-in-the-blanks" model of war termination that will be useful to decision makers.

Rapoport emphasizes the inadequacy of statistical correlation as a basis for decision making: "There are degrees of certainty concerning any surmised causal relation. The weakest criterion is an ordinary statistical correlation. A stronger criterion, in most cases sufficient to establish a causal relation for all practical purposes, is a manipulable correlation. That is, if one observes that by making one of the variables assume some arbitrary value we can induce another variable to assume a statistically correlated value, we have more confidence in the surmised causal relation.", Richardson's work does not produce a formula that can be manipulated to give predictive answers. (p. 256)

Rapoport's discussion of "threshold" phenomena (p. 285) may be relevant to the matter of the impetus that a sudden, strong blow hypothetically gives to war termination. (See bibliographic entries on Calahan, Ikle, and Klingberg.)

RICHARDSON, Lewis F. "War-Moods." Psychometrika, Vol. 13 (1948), pt. 1, no. 3 (September), pp. 147-174; pt. 2, no. 4 (December), pp. 197-232.

This article, which is not now readily available, could not be examined for this report. It is extensively described and discussed by Carroll ("War Termination and Conflict Theory") and Rapoport, in articles listed in this bibliography.

ROTHSTEIN, Robert. "Domestic Politics and Peacemaking: Reconciling Incompatible Imperatives." Annals: How Wars End, pp. 62-75.

Like most of the papers in this volume, this one is focused on US problems in extricating the United States from the Vietnam war. It provides, however, a good description and analysis of the way US and other domestic societies influence the termination of prolonged limited wars, tracing how dissent emerges, spreads to the elite, and then to the inner circle of policy makers.

STUART, Albert, and Edward C. Luck, eds. On the Endings of Wars. Port Washington, New York: Kennikat Press, 1980.

A collection of essays, which, according to a review in Parameters (Vol. II, No. 3, September 1981), is of mixed quality and should be used with discretion. The essays by Luck, Jay Kaplan, and J. Glenn Gray were recommended. The book could not be readily obtained and was not examined for this report.

VOEVODSKY, John. "Quantitative Behavior of Warring Nations." The Journal of Psychology, Vol. 72 (1969), pp. 269-92.

Voevodsky's thesis is that there exist orderly relationships among three categories of wartime "behavioral data": quantities of manpower committed to action, battle casualties, and battle deaths -- and that these follow patterns over time that can allow prediction of approaching war termination or escalation. However, the analysis is based almost entirely

on US participation in five wars, and the author stresses that the work is exploratory only.

The paper should be used with caution, and both the mathematics and the military assumptions subjected to careful scrutiny. For example, Voevodsky states that the purpose of weaponry is to destroy the enemy's effectiveness by killing his troops, and that therefore the relationship of deaths to total casualties is a measure of weapons systems effectiveness. (pp. 275-76) Actually, the purpose of weaponry is to destroy the effectiveness of enemy troops by killing, wounding, frightening, dispersing, and confusing them, disrupting their communications, and destroying their materiel. A high death-to-casualty ratio is not necessarily a measure of weapons system effectiveness. In fact, a high wound-to-kill ratio has often had the effect of removing more men from the battlefield than a high kill-to-wound ratio, since one or more combat soldiers may become involved in the effort to evacuate the wounded. This more realistic assessment of weapons effectiveness appears to remove the significance from the author's plots of deaths against casualties.

Voevodsky suggests that a war is approaching its end when strength, death, and casualty curves all flatten out toward the horizontal and predicts on this basis that the Vietnam war is (in 1969) approaching an end. This was true, but surely the flattening out of the curves resulted from a US decision, already made, to close out, gradually, US participation in the Vietnam conflict. The flattening curves could have served as an indicator of the war's approaching end to a newspaper reader -- if he had access to the data -- but they would have been of little use to the decision makers, whose actions were in fact largely responsible for the terminal shape of the curves.

WHEELER-BENNETT, John W. The Forgotten Peace: Brest-Litovsk, March 1918. New York: William Morrow, 1939.

The termination of the World War I conflict between Russia and the Central Powers is of special interest because of the way in which military operations and peace-table negotiations were interwoven, and because of Bolshevik Russia's attempt to terminate the war without agreeing to the German-Austrian peace terms. This book is useful for the details of negotiations and agreements it provides. Wheeler-Bennett did much to create the image of the Treaty of Brest-Litovsk as extraordinarily harsh; for another view, see George Kennan, Russia and the West under Lenin and Stalin (Boston and Toronto: Little Brown, 1960), pp. 41-45.

War	Appx. Strength (Harpooner) (x 1,000)	Appx. Strength (Casualties) (x 1,000)	Length of war (days)	√days	Winner Casualties / Loser Casualties	Winner Strength / Loser Strength	Casualties / Harpooner Casualties	Casualties / Harpooner Casualties	Amount of Loser's Home Land Destroyed	Fail-ure of Recent Loser Of-fensive?	Losers' Capital city or other im-portant sym-bol?	Severe blow re-sulted by war?	Strong in-creased op-er-ation in war?	Change in gov't. (loser)	Politi-cal Revo-lution (loser)	Inter-vention by out-side power to en-force re-turn of-fered
World War I																
Winner (UK, US, Fr., Italy)	28,573 ^a	11,050	1,531	39,128	1.30	0.611	.025	0.988	no	little	yes	yes	yes	yes	yes	no
Losers (Ger., Aus-Hung, Turk, Bulg)	13,456 ^a	8,523					.041	1.620	no(?)	substan.	yes	yes	yes	yes	yes	no
World War I, Cen Pers vs. Russia			1,251	35,369	0.46	0.505	.023	0.791								
Winner (Ger., Aus-Hung, Turk)	10,825 ^a	2,030					.046	1.567								
Losers (Russia)	12,000 ^a	6,650	92	9,592	8.82	1.667	.650	6.255	no	moderate	no	yes	no	no	no	no
Soviet-Finnish War, 1939							.250	2.363								
Winner (USSR)	1,000	600														
Losers (Finland)	300	68							yes	substan.	no	yes	no	no	no	no
World War II, Europe			1,445	38,013	1.47	0.532	.023	.889								
Winner (UK, US, USSR)	47,100 ^a	15,925					.042	1.671								
Losers (Germany, Italy)	17,000 ^a	10,798							yes	none	no	yes	no	yes	no	yes
World War II, Pacific			1,327	36,428	1.31	0.809	.017	.602								
Winner (US, UK, China)	12,000 ^a	2,633					.020	.744								
Losers (Japan)	7,100 ^a	2,006	434	20,833	0.40	0.489	.081	1.707	no	moderate	no	yes	no	no	no	no
1st Arab Israeli War, 1947-49							.168	3.491								
Winner (Israel)	45 ^b	16														
Losers (Eg., Jord., Iraq, other)	53 ^b	40	1,126	33,556			.002	.07	no	none	no	no	no	no	no	yes
Korean War, 1950-53																
Winner (UK, US, ROK)	5,720 ^c	138 ^c														
Losers (DPRK, China)		1,771	2,911	53,954					no	substan.	no	yes	yes	yes	no	no
Vietnam War, 1965-72																
Winner (US, ROK)	8,745 ^c	352 ^c					.001	.07	yes	moderate	no	yes	no	no	no	yes
Six Day War, 1967			6	2,449	0.31	0.411	.360	.884								
Winner (Israel)	254	5.5					.877	2.149								
Losers (Eg., Jord., Syria)	342	18							no	little	yes	yes	no	no	no	yes
October War, 1973			19	4,359	0.33	0.555	.192	.839								
Winner (Israel)	331	12.1					.346	1.510								
Losers (Eg., Jord., Syr., Iraq)	595	36.6	4	2,000	0.07	0.039	.604	1.389	yes	little	yes	yes	no	no	no	no
French-Tunisian Conflict, 1961							.357	35.714								
Winner (France)	72	12							yes	little	no	yes	no	no	no	yes
Losers (Tunisia)	42	1.0	33	5,745												
China-India War, 1962							.707	4.062								
Winner (China)	40	7							no	little	yes	yes	no	no	no	no
Losers (India)	30		23	4,796	0.97	0.866	.548	2.627								
India-Pakistan War, 1965							.633	3.035								
Winner (India)	100	12.6														
Losers (Pakistan)	50	13.1														

NOTES: ^a Mobilized strength.
^b Strengths are as of October 1948, not beginning of war.
^c US only

MATRIX: SOME CHARACTERISTICS OF 13 20TH CENTURY WARS

WAR TERMINATION MATRIX: NOTES AND COMMENTARY

The Wars

The wars listed in the stub of the table include the following: wars treated in Yengst and Smolin, "Conventional Warfare Damage and Casualty Trends"; the three wars for which case studies were prepared for this report; and the first Arab-Israeli war (1947-49), which was added because it was a post-1945 war on which HERO had carried out considerable research and for which strength and casualty figures were readily available.

Winners and Losers

As indicated earlier in this report, it was decided that winner and loser are the most useful designation for the two sides in most wars, and it proved easy to assign these designations in most of the wars shown on this matrix. The exceptions are the Korean War and the October War of 1973. For the Korean War, however, it seemed clear that the UN/US forces had achieved their initial goal of preventing the conquest of South Korea by North Korea and that North Korea had failed in its initial goal. For the October War the decision was more difficult, since Egypt gained considerably in prestige and national morale from the war. Nevertheless, Israel did successfully defend the territory it had held before the war began and has therefore, with some hesitation, been designated the winner.

Strengths and Casualties

Sources for the strength and casualty figures will be found in the bibliography at the end of this portion of the report. It will be noted that forces committed to the conflict in question have been given whenever possible; in other cases, total mobilized forces have been given. These columns show the great range of wars presented here, from those involving tens of millions to those involving a few thousand. It will

be noted that in a few cases no figures were available, nor was there enough information to support a reasonable estimate.

Lengths of Wars

The lengths of wars show a range similar to the casualty range, for obvious reasons. The square root of the days elapsed in each war is given, in addition to the days elapsed, for reasons that will be explained below.

Comparing Strengths and Casualties

The ratio of winner casualties to loser casualties shows no pattern and a wide variation, ranging from .07 to 8.82. This ratio, however, is not very meaningful in any case, since it does not take into account the initial strengths of the two sides. Simply dividing casualties by strength does not give a meaningful basis for comparison, since this simple casualty rate is so much higher for a long war than for a short war. (This calculation is not shown on the matrix. As an example, the winning and losing sides in World War I had overall casualty rates of 39% and 63% of initial mobilized strength respectively, while the winning and losing sides in the Six-Day War had rates of 2% and 5%, respectively, of committed strength.) Showing the casualty rate as a percent per day is somewhat more useful, but the longer wars now show disproportionately low casualty rates. This is because in any long war, no matter how bloody, there are many days of inactivity, and thus mean casualty rates will always be lower for such a war. To correct this distortion somewhat, the square root of the days elapsed has been used, thus arbitrarily lessening the range in length of wars. What the first three columns of comparisons largely show, however, is the lack of usefulness in comparing casualty figures and casualty rates for wars of different lengths and wars involving forces of widely different strengths. Casualties will always be relatively higher for shorter wars and for wars or engagements involving fewer troops.

The final comparison column is the most meaningful. It shows the ratio of the winner's overall casualty rate to the loser's overall casualty rate. Length of war and size of forces do not distort the results. However, there is still a wide range in the ratios, from .039 for the highly successful French in their Tunisian conflict of 1961 to 1.667 for the battered Soviet winners of the 1939 war with Finland. The ratios cluster between .4 and .6, partly because all three Arab-Israeli wars -- wars fought, basically, between the same opponents in the same general time frame -- fall in this range. There is no basis for practical termination prediction in any of these comparisons.

Qualitative Indicators

The last ten columns of the matrix show factors that have been suggested in the literature as associated with war termination. Each of these factors has been checked against each of the 13 wars shown on the matrix, to determine whether the factor in question was present during the termination phase of the war. It will be noted that only one of the factors shows a strong pattern. In 11 of the 13 wars, a severe, sudden blow suffered by the losing side preceded termination. In most cases this was a dramatically effective offensive, like the Israeli crossing of the Suez Canal and envelopment of the Egyptian Third Army in the Six-Day War, or the Chinese thrust of 90 miles in three days to the edge of the Assam plain in the 1962 war against India. In the World War II Pacific termination, it was the dropping of atomic bombs on two Japanese cities. This pattern supports suggestions by Calahan (who wrote before the end of World War II) and Ikle (see "Survey of the Literature") that sudden, severe blows seem to precipitate termination.

War Termination Matrix: Sources*

Churchill, Winston S. The World Crisis. Vol. 3. New York: Scribner's, 1927.

Dupuy, R. Ernest, and Trevor N. Dupuy. The Encyclopedia of Military History. New York: Harper & Row, 1970.

Dupuy, Trevor N. Elusive Victory: The Arab-Israeli Wars, 1947-1974. New York: Harper & Row, 1978.

HERO Data Base. HERO files.

*See also bibliographies for individual case studies.

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